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Exploration of five condom-related behaviours in the UK: Development and evaluation of a theory-based online safer sex intervention

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**Exploration of five condom-related
behaviours in the UK:
Development and evaluation of a
theory-based online safer sex
intervention**

JA Hancock

January 2013



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*A thesis submitted in partial fulfilment of the University's requirements
for the Doctor of Philosophy for PhD*

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List of abbreviations

AIDS	Acquired Immune Deficiency Syndrome
ANOVA	Analysis of Variance
DoH	Department of Health
HCP	Health Care Professional
HIV	Human Immunodeficiency Virus
HPA	Health Protection Agency
IOSA	Impact on the sexual act
ITT	Intention to treat
MANOVA	Multivariate Analysis of Variance
MN	Moral Norm
ONS	Office for National Statistics
PBC	Perceived Behavioural Control
SN	Subjective Norm
SP	Semi-Partial
STI(s)	Sexually Transmitted Infection(s)
TPB	Theory of Planned Behaviour
TRA	Theory of Reasoned Action
UK	United Kingdom
WHO	World Health Organisation

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Abstract

To prevent unwanted pregnancies and sexually transmitted infections, sexually active individuals should practice safer sex (World Health Organisation 2008). This is important across the lifespan (Nusbaum and Rosenfeld 2004). But older and heterosexual populations are typically overlooked in safer sex interventions (Bodley-Tickell et al. 2008; Bowleg 2011). The Theory of Planned Behaviour (TPB) has been used to predict behaviour, and develop safer sex interventions (Fishbein and Ajzen 2010). But a criticism of the TPB is that it fails to recognise the emotional aspect of safer sex (Norton et al., 2005). Extending the TPB to include affective attitudes has enhanced the effectiveness of safer sex interventions (Ferrer et al. 2011). Furthermore, safer sex typically involves a series of five condom-related behaviours; accessing, carrying, negotiating, using and disposing (Moore et al. 2006). Yet most interventions promote only one condom-related behaviour. In addition, the internet is now being used more as a platform for delivering interventions (Kraft and Yardley 2009). For safer sex interventions, online delivery may help reduce the embarrassment individuals often report when discussing sexual health (Quilliam 2011). Therefore, the aim of this thesis was to develop and evaluate an online safer sex intervention to promote performance of multiple condom-related behaviours in a broad population.

A series of studies were conducted in order to develop the intervention. Study 1, an online elicitation study with 26 individuals, used an extended TPB framework to explore attitudinal, normative and control beliefs toward performing five condom-related behaviours. Findings suggested that individuals hold a range of attitudinal, normative and control beliefs toward performing these condom-related behaviours. Study 2, an online questionnaire study with 363 individuals identified beliefs and behaviours for intervention target. Findings suggested that three condom-related behaviours should be promoted; carrying, negotiating and using. In addition, analysis showed that affective and moral norm beliefs were most predictive of intention to perform these three condom-related behaviours, and should be the intervention targets. Study 3 was an online intervention with 439 individuals. Individuals were randomised to one of three conditions; control message, positively- or negatively-framed persuasive message. TPB and self-report behaviour measures were taken pre-, immediately post-intervention and three months later. Findings demonstrated that performance of condom-related behaviours did not significantly increase from participation in the intervention. However, intention to carry and use condoms increased over time regardless of intervention condition in all populations sampled.

Overall, findings from this thesis support the development of safer sex interventions that promote multiple condom-related behaviours in a broad population. However, findings suggested that persuasive messages targeting psychological constructs of the TPB do not change intentions better than a control message in a broad population. From a public health perspective, these findings suggest that highlighting the benefits of performing condom-related behaviours may be sufficient to strengthen intentions. These strengthened intentions may be protective in the future if the situation arises for an individual which requires the performance of these behaviours. Recommendations for future safer sex research are considered.

Chapter 1

Literature review

1.1 Introduction

Sexual health is important across the lifespan (Nusbaum and Rosenfeld 2004). Sexual intercourse may serve procreation (Christophers, Mann and Lowbury 2008) or pleasure purposes (Hinchliff 2011), and has the potential to improve mental and physical health (Jannini et al. 2009). Sexual health is relevant to individuals who are currently, or may become, sexually active in the future (Lewis 1994). The Department of Health's 2001 Sexual Health and HIV strategy defined sexual health as, "an important part of physical and mental health. It is a key part of our identity as human beings together with the fundamental human rights to privacy, a family life and living free from discrimination. Essential elements of good sexual health are equitable relationships and sexual fulfilment with access to information and services to avoid the risk of unintended pregnancy, illness or disease" (Department of Health [DoH] 2001: 5).

The DoH's (2001) definition of sexual health recognises that some sexual behaviour may lead to negative outcomes, which includes sexually transmitted infections (STIs) and unwanted pregnancies. Worldwide, many countries are seeing a rise in the number of individuals living with Human Immunodeficiency Virus (HIV) (World Health Organisation [WHO] 2009), and in the United Kingdom (UK) the prevalence of some STIs (e.g., genital herpes) is increasing annually in all populations (Health Protection Agency [HPA] 2012). There has also been a rise in gonorrhoea diagnoses in men who have sex with men (HPA 2011), and the UK has one of the highest teenage pregnancy rates in Western Europe (WHO 2008). However, in the younger population there has been a 1% reduction in new cases of chlamydia from 424,782 to 418,598 (HPA 2011), although the reported incidence is still high, this reduction is a positive sign suggesting that initiatives such as the National Chlamydia Screening Programme may be having the desired impact in detecting and treating cases of Chlamydia (Newby, Wallace and French 2012). Treating STIs and unwanted pregnancy is costly (BPAS 2010; Terris-Prestholt et al. 2006), and the STI

gonorrhoea has built up an immunity to antibiotics used in its treatment (Centers for Disease Control and Prevention 2011). STIs and unwanted pregnancies are often the result of risky sexual behaviour (Misovich, Fisher and Fisher 1996). Conner and Norman (2009: 1) state that, “the study of health behaviours is based on two assumptions: that in industrialized countries a substantial proportion of the mortality from the leading causes of death is due to particular behaviour patterns, and that these behaviour patterns are modifiable.” Although risky sexual behaviour rarely leads to death in industrialised nations these assumptions remain relevant. Risky sexual behaviour can be modified, and health risk outcomes reduced.

There are numerous STIs transmitted by a range of sexual behaviours including; penetrative intercourse, oral sex or other forms of skin-to-skin contact such as kissing through sexual contact (Youngson 1999). The only way to completely protect oneself from a STI or unwanted pregnancy is to abstain from sexual intercourse or practice self-masturbation, because even skin to skin contact during non-penetrative sexual behaviour carries some risks (e.g., gonorrhoea or herpes), albeit less so than penetrative intercourse (Delvin 2010). For the majority of individuals, abstinence or self-masturbation are not long-term options for the prevention of STIs and unwanted pregnancy, so other preventative measures warrant attention (Bennett and Assefi 2005).

For STI prevention, condoms are the only preventative measure, if used properly, which will prevent the transmission of most STIs and prevent unwanted pregnancy (Faculty of Sexual and Reproductive Healthcare 2007; WHO 2000). As a barrier method, three ‘types’ of condom are available; the male condom, the female condom more commonly known as the femidom, and the dental dam (Avert 2010; Belfield 1999). Briefly, the use of male condoms can be traced back to around 1000BC (Avert 2011a; Khan and Anjum 2012), designed to cover the penis during sexual intercourse for contraceptive purposes, or as a means of preventing STI during penetrative or oral intercourse (Belfield 1999). The femidom is a loose-fitting polyurethane sheath closed at one end that is inserted intravaginally before sexual intercourse,

introduced to the UK in 1992 it has the same preventative benefits as the male condom (Belfield 1999). The dental dam, a flexible square usually made of thin latex is designed to cover the vagina or anus to protect from STI when performing oral sex (Avert 2010). Of the three ‘types’ of condom, the male condom is the reported preferred barrier method in male and female samples due to its wide availability, dual use purpose, and ease of use (Gallo, Kilbourne-Brook and Coffey 2012; Richters et al. 2010; Vijayakumar et al. 2006).

The approach with the greatest efficacy for reducing numbers of STIs and unwanted pregnancies is to support and promote the performance of safer penetrative sex with either male or female condoms, and safer oral sex with male condoms and/or dental dams. The term safer sex is used rather than safe sex as condoms will only reduce the likelihood of contracting an STI or unwanted pregnancy rather than completely eliminate the risks (Wight 1994). However, condom *use* is only one of a series of condom-related behaviours required for safer sex to be performed; other behaviours include *accessing*, *carrying*, *negotiating* and *disposing* (Moore et al. 2006). As sexual contact is rarely planned (van Empelen and Kok 2008), individuals need to ensure they have the resources available to practice safer sex, such as having a condom available (Arden and Armitage 2008; Jellema et al. 2013). Despite the fact that safer sex involves a series of condom-related behaviours, there have been few studies exploring condom-related behaviours other than *use*.

The recommended standards for sexual health provision in the UK, is to provide individuals with information about safer sex and access to free condoms (Medical Foundation for AIDS & Sexual Health 2005). Using this approach individuals are encouraged to make informed decisions about health behaviours, and be aware of negative outcomes of not performing these behaviours (Broadstock and Michie 2000). However, ‘nudging’ an individual to change their behaviour by increasing an individual’s knowledge about safer sex, and providing free condoms will only have a modest effect in changing an individual’s behaviour (Ajzen et al. 2011; Marteau et al. 2011). The discipline of health psychology acknowledges that health information provision is one

technique for supporting behaviour change (Michie et al. 2008), but recognises that psycho-social factors also influence behavioural decisions (Browes 2006; Hancock, Lees and Brown 2011; Matarazzo 1982; NICE 2007). Health psychology uses theoretical models of behaviour to explore the psycho-social factors that underpin individuals' behavioural choices (Murray 2004). The ability to predict behaviour is important in health psychology, as this allows interventions to be designed to change health risk behaviours, which “reduce the costs associated with the treatment of preventable health problems” (Finlay, Trafimow and Moroi 1999: 2391).

Two theories that have been widely applied to the prediction of behaviour are the Theory of Reasoned Action (TRA; Ajzen and Fishbein 1972) and its extension, the Theory of Planned Behaviour (TPB; Ajzen and Fishbein 1980). These theories have been used to predict a variety of behaviours, including condom-related behaviours (Albarracín et al. 2001; Armitage and Talibudeen 2010; Noar, Morokoff and Harlow 2002). Briefly, the TRA proposes that an individual's intention to perform a behaviour is the key determinant of a behaviour to be performed in the future (Ajzen and Fishbein 1972). Intention to perform a behaviour is assumed to be determined by two psychological constructs; attitude towards performing the behaviour and subjective norm (SN) concerning the behaviour. Attitudes reflect individuals' beliefs about the outcomes associated with performing the behaviour, these beliefs may be positive, negative, or both. SNs represent beliefs that salient others would approve of the individual performing the behaviour (Ajzen and Fishbein 1972). The TRA is restricted to predicting volitional behaviours (Conner and Norman 2009); therefore, behaviours such as condom-related behaviours that require resources, skills or opportunities are often poorly predicted by the TRA (Fishbein 1993). Consequently, the TPB was developed to address this issue. In the TPB, the psychological construct perceived behavioural control (PBC) over the behaviour was incorporated (Ajzen 1991). PBC is considered to be able to both directly, and via intentions, indirectly predict behaviour. The psychological construct of PBC concerns the beliefs an individual holds about

how easy or difficult the behaviour is to perform (Ajzen and Fishbein 1980). Exploring individuals' attitudinal, normative and control beliefs is proposed as the basis for intervention development (Ajzen 2006a). Interventions are then designed to either strengthen salient positive beliefs, reduce the importance of salient negative beliefs, or generate new beliefs toward the target behaviour (Ajzen 2006a; Fishbein and Ajzen 2010; Sutton 2002).

Interventions based on the TRA/TPB have often used persuasive communications to change behaviour, targeting one or more of the underlying psychological constructs in the theory, usually at the beliefs level (Fishbein and Ajzen 1981). Typically persuasive messages have been delivered via posters, newspapers, leaflets or television advertisements (Ajzen 2006a). Using this approach, Hill and Abraham (2008) developed a persuasive message condom promotion leaflet called "wise up to condoms", designed to target the psychological constructs of the TPB. The leaflet targeted individuals aged between 16 and 18 years old, and promoted performance of four condom-related behaviours; *accessing*, *carrying*, *negotiating* and *using*. Messages targeting each of the condom-related behaviours were brief, for example in relation to *negotiating* condom use the message read, "will you put this on me, I'll show you how to do it" (Hill and Abraham 2008: 46). Evaluation of this persuasive message intervention suggested that there were self-reported increases in; *accessing*, *carrying* and *negotiating* behaviours, as a result of reading the leaflet (Hill and Abraham 2008).

Between November 2009 and March 2010 the DoH and the Department of Education in the UK ran a national campaign called 'Sex. Worth Talking About' (SWTA) (DoH 2011a). Although this campaign was not based on the TPB, it was developed based on extensive evidence of the role of health communication on behaviour (Brown and Mackay 2012; NHS Choices 2012). The campaign was aimed at the sexually active under-25 year old population, and used the health message media (posters and television advertisement) suggested by Ajzen (2006a). The SWTA campaign used brief messages to

promote contraception use, such as a speech bubble depicting, “oh no I forgot to take my pill again”, and another speech bubble depicting, “maybe you should get an IUD, then you wouldn’t have to think about it”, with a website signposting the reader to other information concerning contraception (DoH 2011a: 5). Data exploring the impact of the DoH’s (2011a) campaign suggested that there had been an increase in the number of younger women requesting appointments with Health Care Professionals (HCP) to discuss contraception (NHS Choices 2012).

Examples such as those outlined above suggest that brief messages can have the desired impact of changing behaviour, but the content of the message (Blanton et al. 2001), and mode of delivery need to be carefully considered (Abraham and Michie 2008). In recent years the internet has been widely used to deliver health messages (Kraft and Yardley 2009). The internet is a fast-paced environment where information can be accessed promptly (Hafner and Lyon 2003). Brief persuasive messages are arguably well-suited to this mode of delivery, as they may allow internet users to quickly process information (Pequegnat et al. 2007). This may have a positive impact on psycho-social antecedents of condom-related behaviours, and actual performance of condom-related behaviours (Noar, Black and Pierce 2009).

As the TRA and its extension the TPB have been successfully used to predict and change performance of some condom-related behaviours (e.g., Albarracín et al. 2001; Armitage and Talibudeen 2010; Hill and Abraham 2008; Middlestadt et al. 1995; Noar, Morokoff and Harlow 2002; Yzer, Siero and Buunk 2000), a main aim of this thesis was to use these theories to explore the underlying psychological predictors of five condom-related behaviours (*accessing, carrying, negotiating, using and disposing*). To date however, there appears to be a scarcity of literature investigating multiple condom-related behaviours using these theories. Although these theories have been successfully used to predict individual condom-related behaviours, there is an ongoing debate about whether other psychological constructs may enhance the prediction of these

theories (Armitage and Conner 1999a; Godin and Kok; 1996; Lawton, Conner and McEachan 2009; Manstead and Parker 1995). Therefore, a further aim of this thesis was to explore whether an extended TPB is useful in enhancing prediction of these five condom-related behaviours.

When using the TPB to explore the underlying psychological predictors of five condom-related behaviours, the beliefs found to be most predictive of intention can be targeted through intervention in order to change behaviour (e.g., Ajzen 2006a). Therefore, a further aim of this thesis was to analyse data gathered through empirical research to identify the beliefs most predictive of intention, in order to develop a TPB-based intervention promoting performance of multiple condom-related behaviours. In order to develop an intervention using the TRA/TPB a step-wise process of research is recommended (Ajzen 2006a; Sutton 2002), which this thesis followed. The overarching aim of this thesis was to develop and evaluate a TPB-based online safer sex intervention, applicable to individuals across the lifespan. A broad lifespan approach was favoured because statistics regularly published by the HPA suggest that many populations are still seeing a rise in new diagnoses of STIs (e.g., HPA 2010a; 2010b; 2011; 2012), and current public health campaigns are often targeted at specific groups (e.g., DoH 2011a), omitting populations such as older individuals (Bodley-Tickell et al. 2008) and heterosexual men (Bowleg 2011). Therefore, a theory-based inclusive public health approach to STI prevention which promotes performance of multiple condom-related behaviours is needed to tackle this rise in STIs (Glanz and Bishop 2010; NICE 2007).

The following sections of this chapter provide a discussion of the complexities of safer sex behaviour, reviewing theoretical approaches to the study of condom-related behaviours focussing on the TRA and TPB. Different behaviour change techniques and approaches to intervention delivery are also considered, and the role of the internet is explored in support of its use as a vehicle for conducting research and delivering interventions.

1.2 The complexity of safer sex behaviours

Bennett and Bozionelos (2000: 307) state that one of the greatest challenges in health psychology is “the need to determine factors involved in decision making relating to sexual behaviour.” The complexity of sexual behaviour and in particular performance of safer sex *using* condoms has been recognised for some time, as sexual intercourse involves both personal and contextual factors (Terry 1993). An individual’s sexuality also adds to this complexity. Greene and Herek (1994) state that there are three categories of sexuality; lesbians or gay men who are primarily attracted to individuals of the same gender, bisexuals, who are attracted to both men and women, and heterosexuals who are primarily attracted to individuals of the opposite gender. National figures report the majority of individuals in the UK (95%) classify themselves as heterosexuals (Office for National Statistics [ONS] 2010). Sexual orientation adds to the difficulty of supporting and promoting safer sex, as for lesbians the risks of STIs are lower than for heterosexual and gay male populations (Richters and Clayton 2010; Richters et al. 2010).

1.2.1 Condom-related behaviours other than use

Although actual condom *use* is the crucial condom-related behaviour for the prevention of unwanted pregnancies and STI transmission, this is only one of a series of condom-related behaviours required for safer sex to be successfully performed (Bryan, Fisher and Fisher 2002; Jellama et al. 2013). Possibly the first study to recognise this was by Fisher, Fisher and Byrne (1977), who proposed three condom-related behaviours were required; *purchasing* condoms, *communicating* with a partner about condom use, and actual *use* during penetrative or oral intercourse. More recently, Moore et al. (2006: 70) report that “consistent condom use includes five stages: purchasing, carrying, storing, using and disposing.” In the UK, purchasing behaviour per se may not be required as individuals may be given condoms free at, for example, family planning centres (NHS Choices 2010), thus arguably, the term *accessing* rather than *purchasing* should be used. Similarly, *carrying* condoms may be a physical act, but could also incorporate the ‘storage’ element as suggested by Moore et al. (2006). Arguably, the term *carrying* should be used to signify a dual

preparation purpose. These studies suggest that five condom-related behaviours are necessary to achieve safer sex with condoms; *accessing*, *carrying*, *negotiating*, *using* and *disposing*. Despite this evidence suggesting safer sex involves a series of condom-related behaviours, there is a paucity of literature on condom-related behaviours other than *use*.

One of the few studies to explore all five condom-related behaviours was a field study by Moore et al. (2006), undertaken in three locations; night clubs, shopping centres and a university campus, with individuals who had experience *accessing* condoms. Individuals were required to complete an anonymous questionnaire, measuring embarrassment toward these five condom-related behaviours. Regarding *accessing* condoms, most of the sample reported *accessing* condoms in places where face to face contact with other individuals is unavoidable (e.g., supermarkets, health centres and chemists), the remainder *accessed* condoms where no face to face contact was required (e.g., the internet and vending machines). Findings demonstrated that *accessing* condoms appeared to be the most embarrassing condom-related behaviour to perform, followed by *carrying* and *disposing*, with *using* and *storing* (akin to *carrying*) being the least embarrassing. This study suggests the first condom-related behaviour required (*accessing*), for safer sex to ultimately be performed, may actually be as one of the more difficult to execute. Similarly, Gebhardt et al. (2012), report individuals least like *accessing* condoms where face-to-face contact is required as this is strongly related to feelings of embarrassment.

Other research has explored preparatory condom-related behaviours such as *carrying* (Arden and Armitage 2008), and *negotiating* (Noar, Morokoff and Harlow 2002). *Negotiating* condom use requires either verbal or non-verbal communication with a sexual partner about wanting to use a condom (Hill and Abraham, 2008; Noar, Morokoff and Harlow 2002). Preparatory behaviours such as *carrying* condoms (or having them available when the opportunity for sexual intercourse arises), and *negotiating* condom use are crucial (Bryan, Fisher and Fisher 2002; Sheeran, Abraham, and Orbell 1999). Research suggests that not having a condom available is commonly cited as a reason for

unprotected sexual intercourse (e.g., Bryan, Aiken, and West 1997; Vivancos, Abubaker and Hunter 2010). Similarly, condom *negotiation* is a complicated behaviour as an individual is likely to be aware of potential negative impacts on the impending sexual encounter from *negotiating* condom use with a sexual partner (Cook 2012). These condom-related behaviours are key preparatory acts in relation to actual condom *use*, but have often been omitted from studies of safer sex (Sheeran, Abraham, and Orbell 1999). Additionally, Gabler et al. (2008) demonstrated that individuals' intentions to *access* condoms are influenced by intentions to *use* condoms. This suggests that performing preparatory acts may be influenced by intentions to subsequently *use* a condom during sexual intercourse.

Arden and Armitage (2008) argue that condom *carrying* behaviour is relevant to individuals who are both currently sexually active and not currently sexually active, whereas condom *use* is of most relevance to individuals who are currently sexually active. Exploring condom *carrying* behaviour in an adolescent population, Arden and Armitage (2008) found that perceptions of ability to *carry* condoms were different for older and younger adolescents. Younger sexually inexperienced adolescents reported lower perceptions of ability than older and more sexually experienced adolescents. In relation to *negotiating* condom use, studies have explored way in which individuals influence a sexual partner to *use* a condom (De Bro, Campbell and Peplau 1994), and how perceived social norms influence condom *negotiation* (Yzer, Siero and Buunk 2001). In a qualitative study of unmarried heterosexual couples, De Bro, Campbell and Peplau (1994) found that six strategies are used to influence condom *use*; reward, emotional coercion, risk information, seduction, deception and withholding sex. The authors argue that strategies used to *negotiate* condom use were based on power, and these *negotiation* strategies were context-specific. Individuals may use one or more of the influence strategies identified to ensure condom *use* occurred. Condom *negotiation* is an important and often under considered condom-related behaviour in safer sex research (Noar, Morokoff and Harlow 2002). Williamson, Buston and Sweeting (2009) argue that

other factors which influence the performance of this behaviour such as attitudes toward condom *use*, and the influence of other individuals need to be considered in future research.

Condom *disposal* is an unavoidable behaviour that must be performed after condom *use* (Avert 2011b), yet there appears to very few studies exploring this behaviour. Moore et al. (2008) considered embarrassment regarding condom *disposal* in Chinese and Korean populations. Findings suggested that both populations experienced similar levels of embarrassment about performing this behaviour, but less embarrassment over *disposal* than other condom-related behaviours. When either a male or female condom has been used, proper condom *disposal* is vital to ensure that semen does not come into contact with the sexual partner, if this happens the partner may be at risk of pregnancy or a STI (Westheimer and Lehu 2012). Advice concerning proper *disposal* of a used condom suggests they should be disposed of in a bin rather than flushing down a toilet, so as not to block sewerage systems (Advice 1998). Clearly more research is required to understand whether individuals have the knowledge of how to dispose of a condom correctly, and whether this knowledge is reflected in positive attitudes toward disposing, which is likely to lead to the behaviour being executed (Ajzen 2006b; De Wit, Victoir and Van den Bergh 1997a).

Studies such as those reviewed suggest that researching these condom-related behaviours in isolation allows insight into how individuals view each behaviour. Furthermore, the evidence suggests that successful performance of safer sex involves a connected sequence of condom-related behaviours; some need to occur 'pre condom-use', (*accessing, carrying and negotiating*), then actual *use*, with condom *disposal* occurring 'post-use' (Moore et al. 2006). There is a need to explore the whole sequence of condom-related behaviours in order to determine which behaviours should be targeted in safer sex interventions (Davidson and Jaccard 1979). This concept is not new, as Bryan, Aiken, and West (1997) argue that having the resources to perform safer sex (a condom) will lead to increased chances of the behaviour (safer sex) being performed.

Yet, the exploration of the psycho-social factors that underpin individuals' behavioural choices toward performing these five condom-related behaviours has not been explored in the existing literature, making the research in this thesis a unique contribution to the literature.

1.2.2 Condom use and non-use

Condom non-*use* may occur for a number of reasons. It is often considered a normal part of a trusting, committed mutually exclusive sexual relationship (Bolton, McKay and Schneider 2010; Willig 1994). As a method of contraception, condoms may interfere with the sexual act, and tend not to be viewed as long-term solutions to avoiding unwanted pregnancy in heterosexual relationships (Crosby et al. 2008). Women in long-term mutually exclusive relationships often opt for either a long-acting reversible method of contraception or an oral contraceptive (Huber and Ersek 2009), as these are more effective than barrier methods for birth control (National Collaborating Centre for Women's and Children's Health 2005), and do not interrupt the sexual act (Belfield 1999). For gay males, research suggests that condom *use* is viewed largely positively for STI prevention (Harding et al. 2001). As in heterosexual relationships, non-*use* signifies commitment to one's sexual partner, as this is a more risky behaviour relying on trusting one's partner to be monogamous (Ames, Atchinson and Rose 1995). However, even within committed relationships there may be times where the *use* of a condom is necessary, for example when one partner has a yeast infection such as thrush, or for breastfeeding women (Faculty of Family Planning and Reproductive Health Care 2005). Interventions which have attempted to change condom *use* behaviour with individuals in relationships have found that long-term, these individuals tend to report less consistent condom *use* (Sanderson and Jemmott 1996). This is often likely to be due to trusting a partner to be committed and changing to less intrusive contraceptive methods.

Being in a committed relationship is only one reason for condom non-*use* (Beckman and Harvey 1996). Other logical and non-logical reasons for non-*use* have been reported in the literature which include, drinking alcohol (Abbey,

Saenz and Buck 2005), being on holiday (Ford 1991), the ‘heat of the moment’ (Edwards and von Hippel 1995), partner influences (Gebhardt, Kuyper and Dusseldorp 2006), feelings of hopelessness (Broccoli and Sanchez 2009), depression (Brown et al. 2006), cultural reasons (Barrett and Mulugeta 2010) and religious reasons (Coleman and Testa 2008). The influence of culture on sexual behaviour (Kinsey et al. 1953), and religious beliefs on condom use (Rankin et al. 2008), has been known for some time. With respect to religion, Mishtal and Dannefer (2010) argued that individuals may feel conflict between their religious beliefs that prohibit the use of condoms, and financial reasons related to the cost of raising children, as to why condoms need to be used for contraceptive purposes. However, concerning knowledge of AIDS and its transmission routes, Fishbein et al. (1993) demonstrated that this does not appear to differ between religious countries. Furthermore, in a sample of 1,421 men living with HIV in the United States, Galvan et al. (2007) found that Catholic men were less likely to have unprotected sex than other religious denominations or non-religious individuals. This research suggests for some individuals, religious beliefs may be important in supporting condom-related behaviours, particularly when considering the risk of STI or unwanted pregnancy.

Cultural migration means that some individuals move to countries where they may be initially unaware of STIs rates (Klugman et al. 2009), which further adds to the complexity of safer sex behaviour. Individuals migrating to the UK from African countries, which have high incidence of HIV (WHO 2009), may have little knowledge of the HIV epidemic in the UK, and as such perceive the UK as a low-risk country for undertaking risky sexual practices such as *not* using condoms (Barrett and Mulugeta 2010). Similarly, UK residents holidaying in foreign countries may be more likely to engage in risky sexual behaviour (Vivancos, Abubakar and Hunter 2010), possibly due to increased alcohol consumption. Considering the literature reviewed, there appears to be a need to acknowledge the potential influence of an individual’s cultural and religious beliefs in research exploring the decisional processes involved in the

performance of condom-related behaviours. Furthermore, acknowledgement of the logical and illogical reasons for non-use may be require a different approach to exploring the impact of interventions; increasing intentions may be more important for individuals currently in monogamous relationships, and changing behaviour for individuals not currently in monogamous relationships.

1.2.3 Gender and age considerations

The use of a male condom may be a different behaviour to perform than the use of a female condom. If a male condom is to be used for safer sex the male potentially could put one on without consulting a female partner (De Bro, Campbell and Peplau 1994; Morrison, Gillmore and Baker 1995). The ability for females to have more control over safer sex is one of the reasons that female condoms were developed and have proved popular for many female sex workers (Gallo, Kilbourne-Brook and Coffey 2012). Sexual behaviour has been viewed as a gendered issue that continues throughout the lifespan (Gott and Hinchliff 2003; Wight, Abraham and Scott 1998). Ajzen (1991) argues that PBC may have a direct influence on performance of the behaviour; if individuals perceive they have control over the behaviour they are more likely to translate their intentions into actions (Ajzen 2006b; section 1.3.1, page 20). Yet gender issues in male condom *use* may mean that women are “less able to act upon their intentions to use a condom than men” (Sheeran and Orbell 1998: 234), which according to the TPB is the proximal determinant of behaviour (Ajzen 1991; section 1.3.1). Abraham et al. (1996) found that for men, intentions to *use* condoms are significantly correlated with actual condom *use*, but for women this association was not significant, supporting Sheeran and Orbell’s (1998) argument.

Previous research has found gender differences in specific condom-related behaviours, for example, Moore et al. (2006) reported that females found *accessing* condoms a more embarrassing behaviour to perform than males, yet males are more embarrassed about *using* male condoms than females. This may be due to the fact that if a male condom is used it is usually the male responsibility to put on the condom, and this behaviour has sometimes been

reported as causing male erections to subside, which in itself can cause embarrassment (Norris and Ford 1994). In terms of *negotiating* condom use, De Bro, Campbell and Peplau (1994: 171) found that men were more likely to use seduction strategies to avoid *using* condoms such as getting the woman sexually excited and beginning “making love without a condom”, whereas women tend to withhold sex if a partner would not *use* a condom. Muñoz-Silva et al. (2007) suggest that for females, attitudes toward condom *use* are most likely to influence intentions to *use* condoms, whereas for males, psychosocial constructs such as SN and PBC are more likely to influence intentions (section 1.3.1, page 20).

Arden and Armitage (2008: 772) state that “the act of carrying condoms is equivalent for men and women in contrast with condom use, which is a goal for women but a behaviour for men.” However, this statement may only be true if the male condom is to be used in a heterosexual relationship. Arden and Armitage’s (2008) research exploring self-reported condom *carrying* behaviour, found that individuals who perceive they have more control over *carrying* condoms tended to be male and older. These individuals reported having more control over this behaviour than younger and female individuals. However, as they used an adolescent sample, and oldest participants were 22 years old, it would be difficult to generalise this finding to an adult population without further research. Similar findings regarding *carrying* condoms in an adolescent population were reported by Hillier, Harrison and Warr (1998). Analysis of data from separate male and females focus groups identified two broad themes, one of which was of the risks associated with sexual intercourse. Risk of pregnancy from unsafe sex was perceived as greater than the risk of contracting an STI. The adolescent females also talked about a ‘sullied reputation’ as a result of having sex in the first place, whereas the adolescent males reported their reputations would be enhanced if others knew they were having sex. One female commented, “if you carry condoms all the boys think you’re after it” (Hillier, Harrison and Warr 1998: 20), demonstrating that for young women the perception of *carrying* condoms might not be of someone who is responsible

and prepared, but someone who ‘sleeps around’. Hillier, Harrison and Warr (1998) suggest that in terms of safer sex campaigns, the social context in which young people conduct their sexual lives should be considered alongside the fact that condom *use* equals safer sex.

To date the majority of the research exploring condom-related behaviours has been undertaken in younger samples. Reasons for omitting older people have been that “the issue of safer sex is less relevant for older people” (Yzer, Siero and Buunk 2001: 412). Yet men and women continue to enjoy fulfilling sexual relationships into old age (Thompson et al. 2011). In terms of sexual health care, clinicians are often reluctant to broach the topic with clients when they attend for other reasons, such as diabetic monitoring, and older individuals may be reluctant to initiate discussions of a sexual nature (Nusbaum and Rosenfeld 2004). However, individuals of all ages appear to find it difficult to discuss sexual issues with HCPs (Cook 2012; Quilliam 2011). Research has also suggested that post-menopause older women may feel liberated from the threat of unwanted pregnancy, and forget about the risk of STIs with new sexual partners (Hinchliff, Gott and Ingleton 2010; Pearce et al. 2011). This may partially account for the steady rise in new diagnoses of STIs in the older population (Bodley-Tickell et al. 2008). A different approach to promoting condom behaviours in all age groups, which does not require face-to-face contact with a HCP, may therefore be needed.

Older individuals tend to report less condom *use* than younger individuals (Schick et al. 2010), due to long-term monogamous relationships, and not wishing for another sexual partner once their long-term partner has passed away (Gott and Hinchliff 2003). Research has also shown that for *accessing*, *carrying* and *disposing* behaviours, embarrassment appears to be significantly negatively correlated with age (Moore et al. 2006), suggesting that sexual experience may contribute to the reduction in negative feelings associated with condom-related behaviours. Similarly, Yzer, Siero and Buunk (2001) found age differences in condom *negotiation* behaviour; for younger individuals this

behaviour is associated with their intentions to perform the behaviour, but for older individuals past *negotiation* experience is more predictive of future behaviour. There is also literature that suggests older females report relying on male sexual partners to initiate safer sex (Paranjape et al. 2006), which leaves older women exposed to STIs if they feel unable to *negotiate* condom use (Hinchliff, Gott and Ingleton 2010).

It is known that age and sexual experience are positively correlated; older individuals are likely to have better knowledge of safer sex, have greater PBC over condom *use*, and be more likely to turn their intentions to *use* condoms into actual condom *use* (Sheeran and Orbell 1998). As yet it is unclear whether this relationship is true of other condom-related behaviours. Similarly, little is known about how older males and females feel about condom-related behaviours, which needs further exploring as statistics demonstrate an increasing number of STIs in older age groups (HPA 2011). This thesis therefore aimed to develop an intervention applicable to both younger (aged under 40 years) and older (aged over 40 years) individuals, by targeting the underlying psycho-social factors which are most predictive of intention to perform these five condom-related behaviours in a broad population (Ajzen 2006a; Conner et al. 2001; Sutton 2002).

1.2.4 Summary of section 1.2

In section 1.2 it has been argued that performance of safer sex relies on a series of five condom-related behaviours, four of which (*accessing*, *carrying*, *negotiating* and *disposing*) have received relatively little attention in the literature. Furthermore, the literature suggests that there are logical and illogical reasons for condom non-*use*, such as being in a monogamous relationship, and the female using a long acting reversible method of birth control (Bolton, McKay and Schneider 2010; Huber and Ersek 2009). Performance of condom-related behaviours is further complicated by various demographic factors, these factors cannot be altered, but they should be taken into consideration when developing interventions to change behaviour (Sheeran et al. 1990). These demographic factors may also impact on whether safer sex interventions are likely to change

behaviour (Sales et al. 2012a), or serve a protective function by increasing intentions which may lead to future behaviour change when required (Armitage and Talibudeen 2010).

Additionally, the research reviewed suggests that for some individuals, performance of condom-related behaviours may be primarily influenced by the messages of HCPs (NHS Choices 2012; Nusbaum and Rosenfeld 2004), whereas others may be influenced by one's own attitudes, which may have been formed through previous experience with performing these condom-related behaviours (East et al. 2011; Moore et al. 2006). This literature suggests that social cognition theories such as the TRA (Ajzen and Fishbein 1972) and TPB (Ajzen 1991) would be usefully applied to understanding psycho-social factors influencing individuals' performance of all five condom-related behaviours. Arguably, more TPB-based research is required to test this assumption in the full range of condom-related behaviours. The application of the TRA/TPB to the study of condom-related behaviours is discussed in section 1.3 below.

1.3 Social cognition and the application of the TRA/TPB to the study of condom-related behaviours

Conner and Norman (2009) state the factors that influence behaviour broadly fall into two categories; those intrinsic to the individual (sociodemographic factors and individual cognitions); and factors extrinsic to the individual, such as legal restrictions (e.g., limits on maximum number of weeks a woman can be pregnant when opting for an abortion, Family Planning Association 2011), and incentives to change behaviour (e.g., the availability of free condoms from NHS services, NHS Choices 2010). Factors intrinsic to the individual, particularly socio-cognitive factors have been the main focus of research for health psychologists interested in understanding and changing health-related behaviours. Historically various theories have been developed, which attempt to predict the intrinsic factors influencing individuals' behaviour (see Conner and Norman 2009; Fishbein and Ajzen 1975 for reviews). What these theories have in common is that they focus on how cognitive factors result in social

behaviours, and are known as social cognition theories (Conner and Norman 2009).

Of all the social cognition theories, the TRA and TPB have been the most widely applied to the study of condom-related behaviours (Protogerou and Turner-Cobb 2011). McEachan et al. (2011) suggest the appeal of these theories might be attributable to the fact that guidelines are available on how to measure TPB constructs (e.g., Ajzen 2006b; Francis et al. 2004), analyse TPB data (e.g., Hankins, French and Horne 2000; von Haeften et al. 2001) and how to develop interventions based on the theories (e.g., Ajzen 2006a; Fishbein and Ajzen 2010; Sutton 2002). Furthermore, these theories, particularly the TPB, are viewed as inclusive theories of behaviour (e.g., Armitage and Conner 2000; Armitage, Norman and Conner 2002; Bandura 2000; Hagger 2009), as they incorporate psychological constructs from other theories, such as self-efficacy from Bandura's (1977) Social Cognitive Theory, and perceived susceptibility, benefits and barriers of performing health behaviours from Becker's (1974) Health Belief Model (e.g., Ajzen and Fishbein 1980; Fishbein and Ajzen 1975; Rutter and Quine 2002).

Despite the benefits of using the TRA/TPB for exploring the predictors of condom-related behaviours in order to develop an intervention, they have been less widely-applied to develop condom-related behaviour interventions other than those promoting condom *use* (Hill and Abraham 2008). These theories have also typically been used for behaviour prediction and subsequent intervention development in specific rather than broad populations (Gredig, Nideroest and Parpan-Blaser 2006). Arguably therefore, in order to maximise the potential for important public health impact there is a clear rationale for applying these theories to exploring the full range of condom-related behaviours in a broad population in order to inform intervention development. If effective, such an approach could maximise intentions to perform, and performance of all condom related-behaviours.

1.3.1 The psychological constructs of the TRA and TPB

The TRA purports that volitional behaviour (i.e. a behaviour which is under conscious control), is underpinned by an individual's intention to perform the behaviour (Fishbein and Ajzen 1975). Intention reflects the degree of motivation an individual has, and effort they are willing to invest toward pursuing the behaviour in the future. Motivation is required to exert effort to perform the given behaviour; therefore the more motivated an individual is, the more likely they are to perform the behaviour. According to the TRA, there are two psychological constructs reported to influence a person's intentions; attitude toward the behaviour and SN. Underpinning these constructs are an individual's behavioural and normative beliefs, which are said to be the thoughts that first come to mind when an individual is asked to think about the behaviour (Sutton et al. 2003). Although an individual may hold a great many beliefs, it is argued that they can only attend to a relatively small number at any given moment (Armitage and Christian 2003; Fishbein 1967; Miller 1956).

Attitudes are formed from individuals' salient behavioural beliefs and may be positive, negative or a mixture of both (Ajzen 2001). For example, in terms of condom *use* an individual may believe that *using* a condom will protect them from contracting a STI, however, they may also believe that *using* a condom is disruptive to the sexual act (Norton et al. 2005). SN are the perceived social pressures from important others to perform behaviour, which like attitudes are formed from individuals' salient normative beliefs (Ajzen 1991). The TRA attempted to form a complete theory that explained behaviour by considering both individual and social influences on behaviour (Ajzen and Fishbein 1970). However, the difficulty with the TRA is that it could only predict volitional behaviours and it needed to be extended to deal with a wider range of behaviours (Ajzen 1988).

The condom-related behaviours which constitute safer sex are not completely under volitional control, as performance of the behaviour may be reliant on co-operation of another individual, or other situational factors (e.g., the availability

of condoms) (Sheeran, Abraham and Orbell 1999). The constructs from the TPB are viewed as linear and continuous, such that the amount of control an individual has over their behaviour lies on a continuum from those that are easily performed to those that require effort (Eagly and Chaiken 1993). Like the TRA, in the TPB intention to perform a behaviour is the direct antecedent of behaviour, but unlike the TRA, the TPB is able to predict behaviours not entirely under volitional control by including a measure of PBC (Figure 1.1, Ajzen 2006b). PBC is frequently viewed as synonymous with self-efficacy (Ajzen 1991). PBC is concerned with how much control an individual feels they have over performing the behaviour, taking into account both internal and external factors which may enable or inhibit performance of the behaviour (Ajzen 1991). Similar to attitude and SN, they are formed from individuals' salient control beliefs (Ajzen 1991). The addition of the PBC construct explains an extra 5% to 24.3% of the variance in intention, depending on the behaviour under consideration (Armitage and Conner 2001; Godin and Kok 1996).

Figure 1.1: The Theory of Planned Behaviour (Ajzen 2006b)

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PBC may directly influence behaviour bypassing intentions if an individual believes they have control over performing the behaviour and the opportunity and resources to do so (Ajzen 1991), or like the other constructs may influence subsequent behaviour via intentions (Conner and Sparks 2005). The TPB assumes a causal link between the underlying beliefs and their respective TPB constructs (e.g., behavioural beliefs and attitude toward the behaviour),

intention and behaviour (Ajzen 1991; 2006b). Within the TPB it is proposed that external factors, such as an individual's demography, environment, culture and personality will influence underlying beliefs (Conner and Sparks 2005).

The application of the TRA and TPB to a wide range of behaviours and populations over varying time frames has resulted in mixed findings as to its utility in predicting behaviour (e.g., Bennett and Bozionelos 2000; Fishbein and Ajzen 2010; McEachan et al. 2011). The authors cited all argue that poor and variable approaches to measurement of the TPB constructs may contribute to varying results in the predictive value of these theories.

1.3.2 Measurement of the TRA/TPB constructs and behaviours

Testing the assumptions of these theories typically involves using linear regression to predict intention from attitude, SN and PBC, and behaviour from all these constructs (Ajzen and Fishbein 1980). It is proposed that underlying construct beliefs are measured indirectly through the use of expectancy-value measures, whereas the psychological constructs are captured using direct measures (Ajzen 2006b). To indirectly-measure a normative belief for example, the normative belief such as “my sexual partner thinks I should carry condoms” would be multiplied by the corresponding motivation to comply belief, “when it comes to carrying condoms, how much do you want to do what your sexual partner thinks you should do.” These measures typically have scale anchors 1 (*strongly disagree*) and 7 (*strongly agree*). Similarly, behavioural beliefs are measured by multiplying the behavioural belief with the corresponding outcome expectancy, and control beliefs are measured by multiplying the control belief with the corresponding power to comply belief (Ajzen 2006b). However, for studies using the TRA/TPB framework there have been various debates on the measurement scales that should be used (Agnew 2000; Albarracín et al. 2000; Armitage and Christian 2003; Crites, Fabrigar and Petty 1994; Trafimow and Finlay 2002).

A key concept in both theories is the principle of compatibility, which states that when each predictor construct (attitude, SN, PBC) and behaviour are being

investigated four corresponding elements; target, action, context and time (TACT) should be acknowledged (Ajzen 2005). An example attitude TACT in relation to condom *use* behaviour would be: *using (action) a condom (target) when having penetrative sexual intercourse (context) with a new partner in the future (time)*. This rule is applicable to each of the psychological constructs in the TRA and TPB; Ajzen (2006b) reiterates the importance of the principle of compatibility when developing TPB measures, as TPB constructs will be more strongly related to behaviour when they are specified clearly. General attitudes will predict a broadly-defined behaviour (e.g., safer sex), and specific attitudes will predict a specific behaviour (e.g., using a condom every time an individual has sexual intercourse with a new partner) (Conner and Sparks 2005). When the principle of compatibility is adhered to, research has consistently demonstrated that behaviour is better predicted (e.g., Ajzen and Fishbein 1974; Fishbein and Ajzen 2010; Kraus 1995).

In terms of measuring behaviour, Ajzen (2006b) argues that the use of psychometric scaling measurement techniques allows behaviour to be compared to other psychological constructs. Condom research using the TRA/TPB typically uses self-reports for the measurement of behaviour as recommended by Ajzen (2006b). These brief and easy to use measures can lack validity and reliability if not properly developed and piloted (Callaghan, Johnston and Condie 2004). When investigating sensitive behaviours such as condom *use*, there may be a tendency for socially desirable responding (Dyer 1995). However, physiological measures have been shown to correlate with self-reported affective attitudes toward condoms (Lust and Bartholow 2009), biological markers have been used to verify self-reported condom *use* in sex workers (Aho et al. 2010), and objective measures of numbers of condoms used to verify self-reports (Egger et al. 2000). Yet ethically it is questionable whether sexual behaviour can be measured using objective techniques often considered the “gold standard” in other behavioural domains, such as observation, physiological measures and biological markers (Masters, Johnson

and Kolodny 1977). Catania et al. (1990a) argue that in fact there is no “gold standard” for measuring condom *use*.

A meta-analysis exploring the use of self-reported measures for condom *use* behaviour, report good test-retest reliability of self-reported and actual behaviour (Sheeran, Abraham and Orbell 1999). Similarly, when individuals are questioned about condom *use* in a specific time period, and the same measures are taken two months apart, high correlations ($r = .97$) have been reported (Catania et al. 1990b). Even in adolescent populations, where it has been proposed that reporting of behaviour may not be as accurate as the adult population (Giles, Liddell and Bydawell 2005), studies have confirmed that adolescents accurately self-report condom *use* (e.g., Venable et al. 2009). Consistent reporting of condom *use*, using two separate measures has found significant correlation between the measures ($r = .82$), in an adolescent sample (Abraham, Henderson and Der 2004). The literature suggests that self-report measures of sexual behaviour are reliable, less intrusive, and a more socially acceptable measure of sexual behaviour than for example, observation of actual behaviour. Exploring sensitive issues such as condom-related behaviours, using self-report measures are likely to result in larger sample sizes, which may increase the power of statistical data analysis on data from research (Field 2009).

One further debate concerning the measurement of the TRA/TPB constructs was proposed by Miniard and Cohen (1981). They argued that behavioural beliefs underlying attitudes (e.g., my partner does not like to use condoms) are not necessarily distinguishable from normative beliefs (e.g., my partner thinks I should not use condoms). In relation to condom *use*, there has been some debate as to whether the underlying TRA/TPB constructs are related (Trafimow 2000). In a meta-analysis of condom *use* behaviour, Albarracín et al. (2001) explored the relationship between the TPB constructs as proposed by Ajzen (2006b) (Figure 1.1, page 21), and also between constructs where theoretically there should be no relationship (e.g., attitude and SN). Findings suggested a

strong positive correlational relationship between attitude and SN, and weaker relationships between the other theoretical constructs such as PBC and attitude. Although this suggests that the TRA/TPB constructs are related, research has shown that they are three distinct psychological constructs (Darker et al. 2007; Trafimow and Fishbein 1995). Sutton (2002) recommends that future research further explores the full relationships between TRA/TPB constructs, as individuals who have positive attitudes toward performing condom-related behaviours are also likely to believe that salient referents would wish them to perform these condom-related behaviours. Therefore, this thesis explored the relationship between the theoretical constructs, and the distinction between underlying beliefs in relation to five condom-related behaviours.

1.3.3 The ability of the TRA/TPB to predict condom-related behaviours

Theories need to be able to predict future behaviour if they are to be used for the purpose of designing behaviour change interventions (Ajzen 2006a). Kashima, Gallois and McCamish (1993) suggest that condom *use* differs from other behaviours that have been successfully predicted by the TRA because condom *use* depends on the availability of resources (e.g., a condom), opportunity (e.g., a prospective sexual partner), and interpersonal cooperation. Liska (1984) further argues that behaviours requiring resources, opportunity, or cooperation are problematic for the TRA/TPB. Therefore, it needs to be established whether the TRA/TPB is a sufficient theory of behaviour (Ajzen and Fishbein 1980), or whether other psychological constructs add to the predictive value of the theory for the five condom-related behaviours considered in this thesis (Finlay, Trafimow and Villarreal 2002).

Meta-analyses have reported that the TPB constructs explain between 39 and 41% of the variance in intention, and between 27 and 34% of the variance in behaviours in respect of a range of health-related behaviours (Armitage and Conner 2001; Godin and Kok 1996). More specifically, the TPB has been extensively applied to the prediction of condom *use* behaviour, and the constructs have been found to correlate as the theory proposes (e.g., Albarracín et al. 2001). In relation to condom *use*, a meta-analysis by Albarracín et al.

(2001) reported that the TPB constructs explained 50% of the variance in intention, and 30% of the variance in behaviour. The constructs appear to explain a substantial amount of the variance in intention to *use* condoms (e.g., 51.8%; Trafimow 2001), and a smaller amount of the variance in behaviour (e.g., 21.2%; Sheeran, Abraham and Orbell 1999), when regression analyses are used. For condom *use*, Boer and Tshilidzi-Mashamba (2007) suggest that the TPB may explain more of the variance in *using* intentions for male compared to female adolescents (38% versus 22% respectively).

The theories have been applied less-frequently to the prediction of other condom-related behaviours; however, similar findings in the ability of the underlying psychological constructs to predict intention have been reported. For example, using the TPB to predict preparatory condom-related behaviours, van Empelen and Kok (2008) showed that it explains 32% of the variance in *accessing* intention and 28% of the variance in *accessing* behaviour. Armitage and Talibudeen (2010) demonstrated the TPB accounted for 46% of the variance in *carrying* intention, and Yzer, Siero and Buunk (2001) found 25% of the variance in *negotiating* intention and 14% of the variance in *negotiating* behaviour could be explained by the TPB.

Research using these theories to explore condom *use* consistently report that attitudes appear to be more strongly related to intention, and better predictors of intention than SN (Albarracín et al. 2001; Ajzen 2001; Finlay, Trafimow and Jones 1997; Hagger and Chatzisarantis 2005; Sheeran, Norman and Orbell 1999). However, for some individuals SN appears more influential on intentions to *use* condoms than attitude (Albarracín, Kumkale and Johnson 2004; Armitage and Talibudeen 2010; Trafimow and Finlay 1996). One other finding from research applying these theories to condom *use*, is that there is often a weak relationship between PBC and behaviour (e.g., Albarracín et al. 2001), which is discussed further in section 1.3.4 below.

1.3.4 The difficulty with the PBC construct in relation to condom use

Albarracín et al's (2001) finding that PBC is not strongly correlated with actual condom use behaviour is perhaps unsurprising, since Eagly and Chaiken (1993) had previously questioned whether merely having control over a specific behaviour, such as condom use, should predict actual condom use. They postulated that PBC would only be relevant when individuals intended to use condoms, as *not using* condoms would take little control. The TRA/TPB proposes that when individuals have an intention to perform a behaviour (e.g., use condoms) this is likely to be as a result of favourable attitudes toward the behaviour, perceived normative pressure to perform the behaviour and a perception that the behaviour is controllable (Fishbein and Ajzen 1975). Eagly and Chaiken (1993) propose however, that it is likely that when individuals have negative attitudes toward condom use, and perceived normative pressure to *not use* condoms, any perceptions of control would be unrelated to intention. In fact this weak relationship between PBC and condom use has been found in various studies. For example, Reinecke, Schmidt and Ajzen (1996) reported a non-significant correlation between PBC and condom use ($r = -.06$). Similarly, Terry (1993) found no correlation between PBC and condom use in a regression analysis, after they had controlled for the effects of intention. Bennett and Bozionelos (2000) in their narrative review of 20 condom use studies also report weak relationships between PBC, intention and behaviour, particularly for individuals with experience *using* condoms. They argue that sexually experienced individuals are more likely to perceive the difficulties of *using* condoms, particularly with known sexual partners.

Although Ajzen (1991) argues that PBC is synonymous with self-efficacy one way in which the predictive value of the direct measure of the PBC construct has been strengthened in relation to condom use is to distinguish different types of control. Brien and Thombs (1994) demonstrated that self-efficacy is a multidimensional construct, capturing the complexity of intimate sexual contact. A convenience sample of 362 students completed the 28-item condom use self-efficacy scale (CUSES), measuring perceptions of ability to use condoms in

different situations. Using exploratory factor analysis they found the CUSES scale comprised of four factors, which they called; mechanics, partner's disapproval, assertive and intoxicants. The mechanics factor related to items concerning control perceptions over confidence of *using* condoms and *disposing* of them after a sexual encounter. The partner's disapproval factor related to items concerning confidence to deal with a sexual partner rejecting the individual if they were to *discuss* condom use. The assertive factor related to items concerning an individual's perceived ability to be assertive about the *use* of condoms. The final factor, intoxicants related to items concerning the ability to *use* a condom whilst under the influence of alcohol, drugs or passion. Although the authors note that findings from the convenience student sample may not be generalisable to other populations, results suggest that self-efficacy toward condom *use* may comprise of more than one factor. However, the partner's disapproval factor could also be reframed as an attitude toward the behaviour, or as a normative referent who would disapprove of the behaviour. This extends the arguments of Miniard and Cohen (1981) that behavioural and normative beliefs may not be distinct from control beliefs (section 1.3.2, page 22).

1.3.5 Further criticisms of the TRA/TPB

Despite the plethora of research which has successfully applied the TRA/TPB to condom-related behaviours there has also been further critical debate in addition to the one discussed in section 1.3.4 above regarding the PBC construct. Meta-analytic reviews consistently demonstrate that TPB constructs account for around 40% of the variance in intention, but this still leaves 60% unaccounted for (e.g., Armitage and Conner 2001; Cooke and Sheeran 2004; Godin and Kok 1996; McEachan et al. 2011; Sheeran and Orbell 1998; Sheeran and Taylor 1999). Studies have shown that the addition of other psychological constructs within the TRA/TPB can add to the predictive power of these theories (Conner and Armitage 1998; Godin et al. 2005; Lawton, Conner and McEachan 2009; Ravis and Sheeran 2003, Ravis, Sheeran and Armitage 2009). Including psychological constructs such as 'moral norm', which was omitted from the theories, may account for some of the unexplained variance in intention (Ajzen

and Fishbein 1970: 486), particularly in the case of safer sex where a complex relationship between sexual partners is likely (Bennett and Bozionelos 2000; Kashima, Gallois and McCamish 1992). There has also been some debate on whether the constructs in these theories are actually distinct constructs or whether they overlap (Armitage and Conner 1999b; Trafimow and Fishbein 1995, see also section 1.3.2, page 22). Additionally, it has been argued that these theories are unable to account for the role of past behaviour on influencing future behaviour (e.g., Albarracín et al. 2001; Godin et al. 2005; Kippax and Crawford 1993). Future research examining the application of these theories needs to take these debates into account when using the TRA/TPB to predict condom-related behaviours in order to develop an intervention.

1.3.6 Psychological constructs that add to the predictive value of the TRA/TPB

In section 1.3.3 (page 25) it was argued that attitudes within the TRA/TPB are typically stronger predictors of condom *use* intentions than other psychological constructs. Furthermore, in section 1.3.5 (page 28) it was argued that other psychological constructs have been shown to add to the predictive power of these theories. In section 1.2.1 (page 8) the research reviewed suggested that individuals often report feelings of embarrassment when *accessing* condoms. Feelings toward performing behaviours are more commonly known as the psychological construct, affective attitude, defined by Breckler (1984: 253) as “an emotional response to an object that can be measured in terms of physiological response or verbal report of individuals’ feelings.” Within the TRA/TPB attitudes are typically viewed as cognitive attitudes, which relate to the knowledge an individual holds about a behaviour, such as condom *use* (Breckler 1984). Neither theory distinguishes between affective and cognitive attitudes (French et al. 2005); yet separating the cognitive and affective components of attitude toward health behaviours has been shown to add to the theories predictive powers (Ajzen and Driver 1992). It has been argued that cognitive attitudes are likely to be a result of learning, whereas affective attitudes are likely to result from experience with an attitude object (e.g., condoms) (Ajzen 2001; De Wit, Victoir and Van den Bergh 1997a). The role of

affect on behaviour is not a new concept (Rosenberg et al. 1960), and the influence of affective attitudes over cognitive attitudes was first recognised by Zajonc in the 1980's (Zajonc 1980, 1984; Zajonc and Markus 1982). Zajonc (1980) argued that an individual's feelings about an attitude object are often the most immediate, automatic response to it, and these reactions influence the cognitive reasoning toward the object.

In the health field, a seminal paper by Breckler (1984) demonstrated that for blood donation, affective and cognitive attitudes were distinct psychological constructs. Breckler (1984) also established that negative feelings towards blood donation decreased and positive cognitive evaluations increased with more exposure to the attitude object (blood donation). Similarly, Trafimow et al. (2004) using both between- and within-person analyses, demonstrated that between-person affective attitudes were more influential than cognitive attitudes on a range of behaviours. Yet within-persons some individuals are primarily under affective control, and others are primarily under cognitive control. Although neither the TRA nor TPB propose a direct relationship between attitude and behaviour, a meta-analysis by Rhodes et al. (2009) demonstrated that affective attitudes are more strongly associated with self-reported physical activity behaviour than cognitive attitudes.

Lawton, Conner and McEachan (2009) explored the role of affective attitudes in predicting 14 health-promoting (e.g., eating a low-fat diet) or health-risk behaviours (e.g., binge drinking), in a sample of 390 individuals recruited from the general population. Regression analyses demonstrated that for all 14 behaviours affective attitudes were significant predictors of intention, and cognitive attitudes were significant predictors for 11 of the behaviours. In addition, for risk behaviours, larger amounts of variance in intention were accounted for by affective rather than cognitive attitudes (e.g., smoking cognitive variance explained = 3%, smoking affective variance explained = 53%). This finding was also true of self-reported behaviour measured four weeks later, for nine of the fourteen health behaviours, affective attitudes were

significantly stronger predictors of behaviour than cognitive attitudes. The analysis also showed that in no instance were cognitive attitudes stronger predictors of the behaviours. Although this study clearly demonstrated that affective attitudes are important for predicting health behaviours in this study they did not explore the health-risk behaviour of unsafe sex.

In terms of condom-related behaviours, studies have explored the role of affective and cognitive attitudes in relation to condom *use*. In a sample of 270 University students, De Wit, Victoir and Van den Bergh (1997b) explored the structure of affective and cognitive attitudes toward condom *use*. Findings suggested that overall, individuals tended to report negative affective beliefs associated with condom *use*, for example, *using* a condom inhibited sexual pleasure. Yet the cognitive beliefs were more favourable toward condoms, for example, *using* condoms would offer protection from STIs. De Wit, Victoir and Van den Bergh (1997b) also asked participants about the numbers of sexual partners they had, findings suggested that individuals who had no sexual experience, reported more positive affective attitudes toward condoms than individuals who had previously *used* condoms. Yet, the opposite was true in terms of cognitive attitudes, where sexually experienced individuals perceived the *use* of condoms more favourably than did sexually inexperienced individuals. The authors concluded that in terms of attitudes toward condoms and intended condom *use*, researchers need to focus on ways of altering affective beliefs to promote condom *use*.

Norton et al. (2005) conducted a meta-analysis exploring attitudes toward condom *use*, classifying the attitudes assessed in the studies ($n = 57$) as either cognitive or affective. The authors identified two cognitive attitude themes; effectiveness and risk-related partner beliefs, and four affective themes; pleasure, spontaneity, anticipated partner reactions and general affect. Affective attitudes were found to have a large effect size on intentions to *use* condoms ($r = .40$), and cognitive attitudes a small effect size ($r = .11$). Furthermore, affective attitude had a medium to large effect size on condom *use* ($r = .35$),

and cognitive attitudes a small to medium effect size ($r = .22$). The meta-analysis supports the primacy of affect hypothesis (Zajonc 1984) as cognitive beliefs were weaker predictors of intentions and behaviour than affective beliefs. The authors concluded their review by stating that “HIV-prevention interventions will have greater success by addressing negative affective reactions to condom use” such as changing the belief that initiating condom use suggests a lack of trust in one’s sexual partner, as well as promoting the benefits of condom use in terms of protection from unwanted pregnancy and STIs (Norton et al. 2005: 2493).

Findings such as these highlight sexual contact as an emotional interaction between two (or more) partners (Wight, Abraham and Scott 1998). Practising safer sex with condoms will have cognitive benefits, of which reducing the chance of contracting an STI is one. However, the attitude object (a condom), as De Wit, Victoir and Van den Bergh (1997b) demonstrated often has powerful affective beliefs associated with it. These beliefs may decrease the intentions and actual use of a condom if individuals feel this will have a negative impact on the sexual act. Research exploring the structure of outcome beliefs in relation to condom use has shown that the affective belief concerning pleasure is most strongly associated with attitudes toward using condoms, intentions to use condoms, and actual condom use, whereas the cognitive belief concerning protection has little influence (Albarracín et al. 2000). Associations with condom-related behaviours other than use have yet to be explored. Therefore, it seems appropriate that affective beliefs are considered in research exploring multiple condom-related behaviours, as the literature suggests this psychological construct would add to the predictive power of the TRA/TPB and therefore potentially contribute to designing a more effective behaviour change intervention.

In addition, the TRA/TPB focus on SN, exploring individuals’ beliefs about what significant others think they should and should not do (Ajzen 1991). Yet there are other types of normative beliefs, which, although not accounted for within

these theories, have been found to add to the predictive power of the theories. These other types of normative referents are: descriptive norms (DN), and moral norms (MN) (also known as personal norms) (Hee and Smith 2007; Ravis, Sheeran and Armitage 2009). DN reflect an individual's belief concerning whether other people who are important to them (or whose opinion they value) are themselves undertaking the behaviour under consideration e.g., *carrying* condoms (Ravis and Sheeran 2003). MN are an individual's perception of whether they should or should not perform the behaviour under consideration, i.e. is this behaviour morally correct or incorrect (Conner and Norman 2009; Jellema et al. 2013). Since the original concept of the TRA, Ajzen and Fishbein (1980) recognised that other normative referents may well be influential in whether an individual performs a given behaviour. In fact, Ajzen (2006b: 6) recommends when developing a TPB questionnaire, that the measurement of SN should include items that are “designed to capture descriptive norms, i.e., whether important others themselves perform the behaviour in question.” Furthermore, Ajzen and Fishbein (1970) note that MN may well influence behaviours with a moral aspect, of which safer sex is one; and perception of normative pressure to engage in these behaviours may also influence behaviour (Trafimow 1994).

How these other normative components have been included in these theories has varied by study. Some studies have included measures of MN along with the recommended SN measures (e.g., Kashima, Gallois and McCamish 1992; Yzer, Siero and Buunk 2000) and others have included these as separate psychological constructs (e.g., Godin et al. 2005; Parker, Manstead and Stradling 1995; Rhodes and Courneya 2003). Wherever these other normative constructs have been placed they appear to have added to the predictive value of the theories (Bagozzi 1989; Buunk et al. 1998; Conner and Armitage 1998; Jellema et al. 2013). Ravis and Sheeran's (2003) meta-analysis explored the addition of DN to the standard TPB constructs, and demonstrated that including DN increased the variance explained in intention by 5%. The authors noted in their analysis that the standard TPB constructs accounted for 39% of the

variance in intentions, identical to the findings obtained by Armitage and Conner (2001). Similarly, Ravis, Sheeran and Armitage's (2009) meta-analysis showed that including a measure of MN alongside the standard TPB constructs, increased the variance explained in intention by 3%.

Exploring the effects of including MN in the prediction of condom *use*, using a sample of 574 sexually active heterosexual individuals, Godin et al. (2005) demonstrated that the variance in intentions to *use* condoms was significantly increased when a measure of MN was included. Conventional TPB constructs explained 52.2% of the variance in intention, and the inclusion of MN significantly contributed to the predictive value of the theory ($\beta = .27$, $p = .0001$) beyond that of the conventional constructs. Conner, Graham and Moore (1999) and van Kesteren et al. (2007) both report similar findings, where including a measure of MN made a significant positive additional contribution to the prediction of condom *use* intentions. The positive influence MN has on predicting behaviour is perhaps unsurprising given that individuals generally do wish to conform to group norms, which in turn appears to strengthen attitude-behaviour prediction (White, Hogg and Terry 2002).

Despite the evidence that MN is a useful additional psychological construct to include in the TPB, there may be variations in its importance for different types of behaviours or populations. Types of health behaviour tend to be aligned to one of two categories: health-risk behaviours (e.g., smoking, poor diet, and risky sexual practices) (e.g., Forster et al. 2010), and health-promoting behaviours (e.g., regular exercise, good diet, and participation in screening programmes) (e.g., Burak and Meyer 1997). Ravis and Sheeran's (2003) meta-analysis demonstrated both younger samples, and health-risk behaviours had stronger correlations between DN and intentions. In terms of safer sex practices, Wight (1994: 107) acknowledged, "the role that the stage in the life course has in shaping what is considered reasonable behaviour with regard to health." This means that for some age groups, normative influences may be based on peers'

perceptions, and for other age groups the normative influences may be based on MN (McEachan et al. 2011).

1.3.7 Summary of section 1.3

In section 1.3 it has been established that the TRA/TPB have been successfully used to predict condom-related behaviours, most commonly condom *use*. But have been less widely used to explore the wider condom-related behaviours identified important for safer sex in section 1.2 (page 8). Despite the wide application of the TRA/TPB, it appears that the PBC construct may not be a useful psychological construct in predicting condom *use* due to perceptions of control differing from actual control, particularly when resources are required to perform the behaviour (e.g., a condom) (Arden and Armitage 2008). The addition of psychological constructs such as affective attitude, DN and MN appear to add to the predictive value of these theories. This is perhaps unsurprising considering the complexity of condom-related behaviours (section 1.2). Arguably therefore, it is important when using these theories to understand behaviour, and design safer sex behaviour change interventions, that these additional psychological constructs are considered as potential intervention targets. Ensuring that measurement issues such as the principle of compatibility are adhered to, and multiple measures of behaviour are included will further add to the predictive power of these theories. Furthermore, the application of the TRA/TPB to predict intention to perform five condom-related behaviours in a broad population, to identify psychological targets for intervention has not previously been the subject of research (Gredig, Nideroest and Parpan-Blaser 2006). Behaviour change techniques and ways in which the TRA/TPB have been applied to changing behaviour are discussed in section 1.4 below.

1.4 Changing behaviour: Safer sex interventions based on the TRA/TPB

Cumulative literature has demonstrated that providing information alone does not significantly alter behaviour (e.g., Abraham et al. 1992; Hart 1997; Norman, Abraham and Conner 2000). Using behaviour change theory which provides insight into the nature of psychological constructs related to behaviour, to guide intervention development is crucial if health risk behaviours, such as unsafe

sex, are to be changed (Montano et al. 2001). To achieve this, health psychologists must understand which behaviour change techniques, based on such theories, work to persuade individuals to change health risk behaviours (Glanz and Bishop 2010; Michie and Abraham 2004).

1.4.1 Behaviour change techniques

Various papers have been published that define behaviour change techniques and link these to theoretical frameworks (e.g., Abraham and Michie 2008; Michie et al. In preparation; Michie et al. 2011; Michie, van Stralen and West 2011); many of these techniques have met with success in changing risky sexual behaviour. For example, motivational interviewing, a client-led technique which explores an individual's unrealistic optimism about (Weinstein and Klein 1996), and ambivalence toward behaviour change (Rollnick and Miller 1995), has been successfully applied to HIV-risk reduction in gay males (Harding et al. 2001). Prompting specific goal setting, for example using implementation intentions, a brief planning technique to turn an individual's intentions into actions, has been used to enable teenage women to plan contraceptive use, which has in turn reduced subsequent appointments with sexual health clinics for emergency contraception and pregnancy testing (Martin et al. 2009; 2011). Skills based-training, such as practicing opening a condom packet and putting this on a model (Henderson et al. 2007), or providing instructions on how to *negotiate* condom use have also enabled behaviour change (Bryan, Aiken and West 1996). Providing information about consequences of health risk behaviours, and others' approval for using condoms, in the form of persuasive messages have been widely used in interventions to promote condom *use* (Albarracín et al. 2005), often successfully (Carnaghi et al. 2007). Persuasive messages have the ability to reach a wide audience (Ajzen 2006a), and can be delivered cheaply compared to face-to-face skills-based interventions (Rigby et al. 1989). However, the content of persuasive messages which are most likely to change behaviour in a positive direction is still unclear (Fishbein and Cappella 2006).

Fishbein and Ajzen (1975: 451) recommend the use of persuasive messages in behaviour change interventions based on the constructs of the TRA/TPB, as it has “always been viewed as the major strategy of influencing people.” However, these persuasive messages need to be specific to a behaviour (e.g., using a condom), rather than behavioural categories (e.g., safer sex) to be effective (Fishbein 2000). Triandis (1971: 171) argued that “persuasive messages that make it clear that there will be positive reinforcements if a given position is adopted are likely to lead to compliance.” In terms of complex behaviours such as safer sex, this type of persuasive message may not have the desired effect, as the social context of the behaviour also needs to be considered (Foucault 1979). Eagly and Chaiken (1993: 227) recognised that persuasive messages could bring about the desired behaviour change by either stating a conclusion about the behaviour or by “presenting individuals with unfamiliar premises with positive implications.” For interventions based on the TRA/TPB, Fishbein and Ajzen (1981) recognise that persuasive messages may also change an individual’s beliefs about the behaviour in question other than those stated in the persuasive argument. Many early persuasive messages to promote condom *use* were based on fear appeals (McCamish et al. 1993). These fear appeals often did little to change behaviour (Aggleton, Davies and Hart 1994; Rigby et al. 1989). It has been argued that increasing fear may trigger defensive behaviours which reduce the effect of the persuasive message (Boster and Mongeua 1984; Janis and Feshbach 1953; Kok et al. 2004; Sutton 1982). Fear is just one aspect of affective attitude, and it has been argued that targeting other affective attitudes through persuasive messages may be better catalysts of behaviour change than fear appeals (French et al. 2005; Janis 1967; Jessop and Wade 2008; Ruiter, Abraham and Kok 2001).

There is a large body of literature which explores the impact of message framing on persuasive messages aimed at changing behaviour (e.g., Albarracín et al. 2005; Covey 2012; Gallagher and Updegraff 2012; Kiene et al. 2005; Latimer, Salovey and Rothman 2007; O’Keefe and Jensen 2009; Rothman and Salovey 1997; Rothman et al. 2006). In one such study applied to condom *use*,

Blanton et al. (2001) presented 120 University students with unfamiliar premises about social images of individuals who do not *use* condoms. Participants were exposed to one of three messages; a negatively-framed persuasive message stating that individuals who do not *use* condoms are less responsible and more selfish, a positively-framed persuasive message stating that individuals who *use* condoms are more responsible and less selfish, and an unrelated to the topic of investigation (condom *use*) control message describing the typical individual who does not vote as more selfish and less responsible than individuals who do vote. Findings demonstrated that individuals who read the negatively-framed messages were less willing to have unprotected sex than individuals who read the positively framed or control messages. Blanton et al. (2001: 299) conclude that “making the unhealthy person salient appears to have invoked a more informative standard of comparison, which resulted in greater commitment to having safer sex in the future.” However, as only a measure of willingness to perform safer sex was taken, it is unknown whether a negatively-framed message would have a greater impact on actual condom *use* behaviour than a positively-framed or control message.

Blanton et al’s (2001) study primarily explored social images, however, framing an individual as responsible may also be viewed as an affective attitude; an individual may feel responsible from *using* condoms. This type of message framing is likely to enhance both attitudinal and normative beliefs, which are both important constructs in the prediction of behaviour (Ajzen 1971; Trafimow and Finlay 1996). Block and Keller (1995) argue that persuasive messages that accentuate the negative at times may be more effective at changing behaviour than messages that accentuate the positive. In a study of 94 undergraduate students, Block and Keller (1995) demonstrated that presenting a brief negatively-framed persuasive message regarding STI prevention, which required little processing of the information, was more effective at changing intentions and attitudes than a brief positively-framed persuasive message. However, when the message required more processing the opposite was true,

the brief positively-framed persuasive message was more effective at changing intentions, but there was no difference in the message-framing for attitudes.

If simple persuasive messages have the capacity to change intentions and behaviour this could be an effective way to tailor safer sex messages to reach a broad population (Fishbein, von Haeften and Appleyard, 2001; O’Conner et al. 2009). However, the framing of the persuasive communication needs to be considered in order to develop messages that have maximum benefit in changing behaviour (Central Office of Information [COI] 2009). Promoting negative perceptions of individuals that do not perform healthy behaviours may be an effective method of changing intentions to perform health risk behaviours (Blanton et al. 2001; Levin, Schneider and Gaeth 1999; Rothman and Salovey 1997; Rothman et al. 2006). Changing intentions may lead to immediate or future behaviour change (Ajzen 2006a; COI 2009; Webb and Sheeran 2006). Arguably therefore, the effect of persuasive message framing on intention to perform, and self-reported performance of condom-related behaviours could be considered an important focus of future research.

1.4.2 TRA/TPB-based interventions

Interventions based on the TRA/TPB tend to report effective behaviour change compared with interventions based on clinical knowledge (Fife-Schaw and Abraham 2009; Fisher and Fisher 1992; Jemmott and Jemmott 2000; Michie and Abraham 2004). However, Fife-Schaw and Abraham (2009) argue that the magnitude of behaviour change that can be expected from interventions targeting cognitions may be small, particularly in relation to condom use. To demonstrate this, Fife-Schaw and Abraham (2009) used Cohen’s (1992) recommended effect sizes, and assessed these against the TPB constructs in order to establish the impact these constructs may have on changing behaviour. Findings suggested manipulating the TPB constructs may have an effect size of $d = 0.16$ on condom use. This is smaller than the effect sizes of $d = 0.26 - 0.29$ reported by Albarracín et al. (2005) in a meta-analysis on passive and active HIV-interventions, which included interventions targeting TPB constructs. Nevertheless, this does highlight that changing cognitions may only have limited

impact on altering actual behaviour (Webb and Sheeran 2006). Yet in the right context, such as promoting condom-related behaviours to prevent the transmission of STIs and unwanted pregnancy at a public health level, these small effect sizes have the potential to be accumulative into larger effects if health risk behaviours are successfully changed and maintained long-term (Crosby and Rothenberg 2004; Prentice and Miller 1992).

Successful interventions based on the TPB constructs have been reported in the literature. One such brief intervention used persuasive messages to change adolescents' intentions to *carry* condoms (Armitage and Talibudeen 2010). The pre-post intervention design had an active group and a control arm, in the active arm individuals were presented with statements relating to each of the TPB constructs. For example, a statement about attitudes towards *carrying* condoms, and three facts about the benefits of condoms in reducing transmission of STIs were presented. The control arm required individuals to read information on the history of the condom. Armitage and Talibudeen (2010) found the intervention condition significantly increased individuals SN and intention scores, but not attitude or PBC. Although this pre-post intervention design could not determine whether the intervention changed condom *carrying* behaviour, it was encouraging to see that intentions to perform this behaviour increased as a result of the intervention. Given that significant correlations are often reported between intention and actual behaviour, this increase in intention to *carry* condoms may well be turned into actual behavioural change (Fishbein and Ajzen 2010; Webb and Sheeran 2006). Furthermore, because the authors found that SN was the principal predictor of intentions rather than attitude or PBC, they concluded that future interventions may wish to target SN, given that “condom carrying is driven largely by social norms” (Armitage and Talibudeen 2010: 166).

Similarly, Conner et al. (2011) used persuasive messages in a TPB-based intervention which separated the affective and cognitive components of the attitude construct. This intervention was designed to change exercise behaviour

in a sample of 383 University students. Individuals were randomised to one of five conditions, 1) control, 2) written affective message, 3) written affective message plus an affective picture, 4) written cognitive message, 5) written cognitive message plus a cognitive picture. Pre-intervention there were no differences in exercise behaviour between the conditions. Post-intervention findings showed a small but significant increase in exercise behaviour in both the control and cognitive attitudes conditions, but a large significant increase in the affective message condition. Findings suggest that an affective attitude based intervention will produce a larger change in exercise behaviour than either a control or cognitive intervention.

As sexual behaviours are affectively laden behaviours (section 1.3.6, page 29), there should be a focus on including affective components in future behaviour change interventions as has been adopted in the exercise literature. To date, few TRA/TPB based safer sex interventions have included affective components (Ferrer et al. 2011; Gottsegen and Philliber 2001; Norton et al. 2005; Ragon, Kittleson and St. Pierre 1995). Ferrer et al. (2011) compared a standard social-cognitive intervention (SC) that gave facts about risky sexual behaviours, to a social-cognitive-emotional intervention (SCE) which also gave facts about risky sexual behaviours but highlighted that *using* a condom demonstrated you cared for your sexual partner, and *using* a condom would heighten individuals' feelings of confidence and security. Results demonstrated that 3-months post-intervention, individuals in both the SC and SCE conditions reported significantly more condom *use* than individuals who had been assigned to a control condition of standard care. However, 6-months post-intervention only the SCE group were still self-reporting more condom *use*.

Although the findings from these studies are encouraging, they were all applied in student samples. It is known that student populations differ from the 'general population' in terms of education-level and age (e.g., Allen 1970; Korn 1988). Many of the TPB-based interventions reported in the literature are initially tested in student populations, as many student populations are required to participate

in research for course credits (Jackson et al. 2005; Webb 2010). Elliott and Armitage (2009: 113) report that “76% of previous studies using student samples found significant intervention effects compared with 53% of the studies using non-student samples.” In terms of TRA/TPB-based interventions there is a growing body of literature supporting their effectiveness in changing behaviour in non-student populations (e.g., Francis et al. 2009; Middlestadt et al. 1995; Sales et al. 2012b). Clearly, more research is needed to determine whether TRA/TPB-based safer sex interventions are effective when applied in broader populations (Glanz and Bishop 2010), given the high incidence of STIs in the general population (HPA 2012).

1.4.3 Methods of intervention delivery

Traditionally safer sex interventions have been delivered face-to-face, often in classrooms (Jemmott and Jemmott 2000), or health clinics (Martin et al. 2009). These interventions typically take the format of multiple sessions delivered over a number of weeks (Stanton et al. 1996), or one session comprising of various elements such as information giving and practicing skills (Bryan, Aiken, and West 1997). In recent years with the development of the internet, interventions to change a variety of behaviours have been successfully delivered online (e.g., Bull et al. 2012; Eysenbach 2008; Griffiths et al. 2006; Norman et al. 2007; Webb et al. 2010). Online interventions may overcome issues of treatment fidelity (Bellg et al. 2004; Hardeman et al. 2008), be accessible for hard to reach groups (Rice 2010), reduce delivery costs and be more convenient for users (Griffiths et al. 2006).

Online safer sex interventions tailored to the target population do appear to reduce rates of unsafe sex three months after delivery (Mevisen et al. 2011). Noar, Black and Pierce (2009) conducted a meta-analysis to determine the efficacy of computer technology-based HIV prevention interventions. The interventions included in the review ($n = 12$), used either desktop or laptop computers, the internet, or mobile phones to deliver the intervention, and included data from 4639 individuals. Calculation of the effect size of these interventions on condom use resulted in a mean effect size of $d = 0.26$, which is

larger than the effect size found by Albarracín et al. (2005) of $d = 0.18$ in HIV-preventive interventions *not* delivered by computer technologies. This suggests that interventions to promote safer sex may be more effective if delivered through the internet rather than face-to-face, possibly due to a reduction in embarrassment from not having to discuss sexual practices face-to-face with health care professionals (Fogg 2003; Quilliam 2011). In terms of safer sex interventions delivered online, Noar, Black and Pierce (2009: 107) conclude that “given their low cost to deliver, ability to customize intervention content, and flexible dissemination channels, they hold much promise for the future of HIV prevention.”

Card et al. (2011) demonstrated how a successful face-to-face HIV prevention intervention, which had been shown to increase consistent condom *use* 3-months post-intervention, could be translated to also be successfully delivered online. The SISTA (Sisters Informing Sisters on Topics about AIDS) face-to-face intervention was translated into the SAHARA (SISTAs Accessing HIV/AIDS Resources At-a-click) online intervention. After translating the intervention for online delivery, they found that the online intervention took a quarter of the time to deliver compared to the offline version. Furthermore, they were able to reach a wider audience using the online delivery. Individuals living in rural communities with poor transport links were able to participate in the online intervention, who would have otherwise been excluded using ‘traditional’ delivery. Women completing the online intervention similar to the offline version, reported consistent condom *use* 3-months post-intervention. These findings demonstrate that the same intervention may be delivered successfully both on and offline but the online version has the potential to be used by a wider audience than the offline version.

A limitation of the study by Card et al. (2011) was one of the exclusion criteria for both the on and offline interventions. Women who were married or living with their partner, not sexually active or using condoms 100% of the time were not eligible to enrol. Although safer sex is not as relevant for women in exclusive

committed relationships, the promotion of condom-related behaviours is still important for all women as relationship status may change in the future (see section 1.2.2, page 12; also Nusbaum and Rosenfeld 2004). Due to the low cost of delivering online interventions, it would seem appropriate to develop a safer sex intervention to include individuals currently in and not in a relationship.

Brief TRA/TPB-based online interventions have the potential change health risk behaviours (Sniehotta, Araújo Soares, and Dombrowski, 2007), and internet interventions based on the TRA/TPB appear to be more effective than those based on other theories of behaviour change (Webb et al. 2010). Therefore, there is a clear rationale for developing online interventions which are more inclusive of populations usually overlooked in safer sex interventions (Bowleg 2011; Gredig, Nideroest and Parpan-Blaser 2006). However, although cheap to administer (Griffiths et al. 2006), development could potentially be costly if specialist programming skills are required (WHO 2012). To address the issue of developing online interventions with little or no financial cost to the researcher, a team of health psychologists and computer programmers through funding from the UK Economic and Social Research Council developed 'LifeGuide' (Teasdale et al. 2012; Williams et al. 2010). LifeGuide enables individuals with no programming knowledge to develop and evaluate an online intervention (Williams et al. 2010). Feedback from individuals who have participated in LifeGuide based interventions tend to be positive (Morrison et al. 2009). To date it appears that there have been few interventions targeting multiple behaviours (Kypri and McAnally 2005; Werch et al. 2008), and in terms of safer sex, even fewer targeting multiple condom-related behaviours in a broad population (Noar, Black and Pierce 2009). Developing and piloting a safer sex intervention, promoting the performance of multiple condom-related behaviours in a broad population using the LifeGuide software, would allow for an inexpensive trial of an online TRA/TPB-based intervention (Campbell et al. 2000).

1.4.4 Summary of section 1.4

In section 1.4 techniques used in health psychology to change behaviour have been explored. To reach a wide audience, persuasive messages manipulating the psychological constructs of the TRA/TPB have successfully been used to change intentions and behaviour (Stead et al. 2005). Furthermore, the literature suggests that manipulating affective attitudes may have a greater impact on changing intentions and behaviour than manipulating cognitive attitudes. These findings support the rationale to separate affective and cognitive components of attitudes for the exploration of five condom-related behaviours. The internet has been used to deliver safer sex interventions, which some literature suggests may result in larger effect sizes than interventions delivered offline. However, this result needs to be interpreted with caution given that results are based on self-reported behaviour; nevertheless, the finding remains encouraging for online safer sex interventions. The developing role of the internet in research and health care is further explored in section 1.5 below.

1.5 The role of the internet in research and health care

Since its conception in the 1960's, the internet has changed the way individuals communicate with one another and seek information (Hafner and Lyon 2003). It has been estimated that 82.2% of the UK population use the internet, with the largest proportion of users aged between 16 and 24 years (ONS 2011a). Over three-quarters of UK households have internet access at home, with rises in the numbers of over 64 year olds reporting this in recent years (Ofcom 2011). It has been estimated that 74% of internet users seek health information when online (Dutton and Blank 2011). A plethora of health information is available (NHS Direct 2011; Phoenix and Coulson 2010), and it varies greatly by source; some are more reliable and trustworthy than others (Sillence et al. 2007a; 2007b). In addition, many individuals are now using social networking sites, with Facebook being the most popular worldwide (Facebook 2011; Ofcom 2011). Social networking is used for varying reasons (e.g., Kim and Lee 2011; McGinnis 2011); including as a tool for undertaking research (e.g., Bull et al. 2011; 2012; Hanna 2012).

More recently, individuals are using the internet to meet new people including sexual partners (Couch and Liamputtong 2008; Dutton and Blank 2011; Robinson et al. 2000; Rosenberg et al. 2011; Stephure et al. 2009; Summersgill 2008). Tenore (2006) suggests that internet dating sites should provide warnings on STIs but to date this has not happened. Whether sexual partners initially meet online or in 'traditional' environments, practicing safer sex if sexual intercourse occurs is vital to protect individuals from unwanted pregnancies and STIs (e.g., Belfield 1999; Clutterbuck et al. 2011). As the internet may be used to meet new sexual partners, it would be appropriate to develop an online safer sex intervention promoting performance of condom-related behaviours which lead to safer sex.

1.5.1 The internet as a source of health care advice

In the UK, the NHS Direct website is the main provider of accurate online health information (NHS Direct 2011). Powell et al. (2011) explored the characteristics of 792 individuals who use the NHS Direct website to seek health information, and undertook in-depth interviews with 26 of these individuals. Results demonstrated that more women than men used the internet for health information. Individuals sought information prior to consultation with a HCP concerning a new health issue. The majority of NHS direct users appeared to be well educated with a University degree or equivalent. Qualitative results suggested that individuals used the NHS Direct site in preference to other health sites as the NHS was viewed as a recognised health provider. This finding supports previous research demonstrating that the credibility of sources of information has been shown to affect the impact of persuasive messages (Keller and Brown 2002; Petty and Cacioppo 1984; Roskos-Ewoldsen and Fazio 1992). Convenience and anonymity of using online health information were also cited as reasons for using the internet.

Findings from the study by Powell et al. (2011) suggests that interventions targeting safer sex, which may be a difficult issue to broach with a HCP (Nusbaum and Rosenfeld 2004), may be successfully delivered online, as individuals can anonymously access the intervention at a time convenient to

them (Griffiths et al. 2006; Pequegnat et al. 2007). Griffiths et al. (2006: e20) argue that “the health care community should aim to harness the potential benefits of the internet.” This supports the recommendations of meta-analyses promoting the application of online interventions as a source of health care information, and setting for delivery of behaviour change interventions (e.g., Noar, Black and Pierce 2009; Webb et al. 2010).

1.5.2 The internet as a setting for research

Interventions have successfully been delivered on the internet (section 1.4.3, 42, also Kraft and Yardley 2009). However, the internet may also be used as a research tool to undertake TRA/TPB elicitation and ‘main’ studies (Bosnjak, Tuten and Wittmann 2005). Benefits of using the internet to collect data for studies include being able to set individual questionnaire items as ‘required fields’ in order to reduce the amount of missing data (Bosnjak and Tuten 2001), the ability to download data into statistical analysis packages thus reducing transcription errors and saving researcher time (Sommer and Sommer 1997), the potential to recruit large samples at low cost (Pequegnat et al. 2007), and the potential to reduce socially desirable responding (Kalichman et al. 2008). Furthermore, the response rates of traditional postal surveys are often low, which incurs monetary cost to the researcher (Kaplowitz, Hadlock and Levine 2004).

Research has found that individuals attitudes toward the topic of research will influence whether they respond to a request to complete a survey (Helgeson, Voss and Terpening 2002). In a sample of 400 undergraduates who completed standard TPB measures in an online questionnaire, Bosnjak, Tuten and Wittmann (2005) found that MN was a significant predictor of why some individuals complete online questionnaires and others do not. Although there are benefits with using online questionnaires for TPB studies, samples may be biased toward individuals who have an interest in the research topic and feel a moral obligation to participate in research.

When designing interventions based on the TRA/TPB, conducting an elicitation study is considered an important first step in the research (Ajzen 2006a; Francis et al. 2004). The elicitation study is a qualitative piece of research, where individuals respond to open-ended questions about the behaviour(s) under consideration (Ajzen 2006b). Research exploring novel topics is ideally placed for qualitative research, as individuals may express their own views from open-ended questions the researcher poses (Grbich 1999), and the data gathered is often detailed (Banister et al. 1994). Yardley (2000: 219) states that good qualitative research needs to be “sensitive to content, demonstrate commitment and rigour, be transparent and coherent, and demonstrate an impact.”

Traditionally, elicitation research has been conducted by undertaking face-to-face interviews or focus groups (Francis et al. 2004). These methods are time consuming in terms of arranging interviews/focus groups, and transcribing once these are complete (Chamberlain 2004). To overcome time issues, qualitative data has been successfully collected online (Schnall et al. 2011). In addition, when exploring sensitive issues such as safer sex, online elicitation studies may help to overcome issues of anonymity, and allow individuals to disclose views they may not in a face-to-face context (Davis et al. 2004). Elicitation studies in the TRA/TPB should follow Ajzen’s (2006b) guidelines for question wording, and be analysed using content analysis (Krippendorff 2007). Content analysis enables an individual’s words to be grouped with other individual’s words, and then classified into fewer categories or themes (Weber 1990). Identification of themes in elicitation studies allows the researcher to identify modally salient beliefs toward the behaviour in the target population, which ultimately may be targeted for intervention purposes (Ajzen 2006a). There appears to be a paucity of literature exploring the use of online methods for TRA/TPB elicitation studies, therefore the use of the internet for this type of study was explored in this thesis, as funders are often looking for cost-effective approaches to research (Davis et al. 2004).

1.5.3 Summary of section 1.5

In section 1.5 it has been highlighted that a wide range of individuals are using the internet for a variety of reasons including health and well-being issues. The popularity of social networking sites means that research and interventions advertised on these sites would have the potential to reach a broad range of individuals. However, internet research may need to use brief questionnaires and brief interventions to retain individuals in studies, as the fast-paced internet environment may not be well-suited to lengthy studies. The literature reviewed supports the use of internet based research, and seems particularly relevant for exploring sexual health with broad populations.

1.6 Purpose of the Thesis

1.6.1 Summary of literature review

Despite the 1% reduction in new cases of chlamydia there are still high numbers of STIs and unwanted pregnancies in the UK. Furthermore, in the older (i.e. non-adolescent) population new cases of STIs being diagnosed is increasing, suggesting that they have been a population overlooked in interventions designed to promote condom-related behaviours. Interventions aimed at changing condom-related behaviours need to be grounded in theory, such as the TRA/TPB, as they have been repeatedly shown to predict condom *use*, and interventions based on theory are more effective than those which are not. However, to date there appears to be a paucity of literature grounded in the TRA/TPB that predicts other condom-related behaviours, and even less literature exploring beliefs toward performing multiple condom-related behaviours.

Although five condom-related behaviours appear necessary for safer sex to be successfully performed, behaviours other than condom *use* have been little explored. Arden and Armitage (2008: 722) state that “ideally, an intervention would focus on all of these (condom-related) behaviours.” Further exploration of the full range of condom-related behaviour within an extended TPB framework, separating affective and cognitive attitudes would appear appropriate, as research has suggested for some behaviours, affective beliefs may be more

predictive of intention than cognitive beliefs. Using this exploration of beliefs toward the full range of condom-related behaviours, this thesis focuses on the development of a TRA/TPB-based intervention, applicable to a broad population, encompassing different genders, age groups, sexual orientations, individuals currently in and not in relationships, and ethnic backgrounds and is focused on promoting multiple condom-related behaviours.

The internet is a fast growing medium for research and intervention delivery (Kraft and Yardley 2009). Given the sensitive nature of safer sex, and the reluctance of certain populations to broach sexual health issues face to face with health care professionals (Quilliam 2011), developing an online safer sex intervention has been identified as appropriate. Considerations need to be made when undertaking internet based research, for example, brief questionnaires are required compared with offline research (section 1.5.2, page 47). This is because of the immediacy of the internet, where users expect information quickly (Hafner and Lyon 2003). The intervention to be developed as part of this thesis needs to be appropriate for the target population, therefore the best way to frame persuasive messages for a broad population intervention needs to be considered once target beliefs have been identified (section 1.4.1, page 36).

1.6.2 Outline of the Thesis

The overall aim of this thesis was to develop and deliver an online safer sex intervention based on an extended TRA/TPB. It was intended that individuals of different sexual orientations, genders, age groups and ethnicities would participate. The intervention aimed to increase their intentions to perform multiple condom-related behaviours, and potentially change self-reported performance of condom-related behaviours for individuals who are not currently in monogamous relationships. The research addresses the high rates of STIs in all populations (section 1.1, page 1). There was clearly a need to develop a persuasive message-based intervention (section 1.4, page 35), targeting psychological constructs of the TRA/TPB most predictive of intention (section 1.3, page 18), which can be delivered relatively inexpensively online (section

1.5, page 45), targeting one or more condom-related behaviours (section 1.2, page 8). This thesis applied Ajzen's (2006) recommended stages of TPB intervention development. The following three chapters describe an empirical study, which relates to one of these intervention development stages.

Chapter 2 describes an elicitation study of affective, cognitive, normative and control beliefs toward performing five condom-related behaviours; *accessing*, *carrying*, *negotiating*, *using* and *disposing*. This research was required as these five condom-related behaviours are important for safer sex to be achieved, but behaviours other than *use* have received little attention. The chapter contributes to the literature reviewed in section 1.2 (page 8) regarding the complexities of condom-related behaviours in a broad population. The inclusion of an exploration of affective beliefs toward these five condom-related behaviours contributed to the current literature, which suggests affective beliefs are important for condom-related behaviours (sections 1.2.1 and 1.3.6, pages 8 and 29). The primary aim of this study was to elicit extended TPB beliefs (affective, cognitive, normative and control), toward five condom-related behaviours to be used in a questionnaire study. The secondary aim of the study was to determine whether a broad population sample of all ages and backgrounds would respond to an online survey.

Chapter 3 describes a questionnaire-based cross-sectional study. This research was required to build on the existing literature concerning how the TPB predicts the full range of condom-related behaviours (section 1.3.3, page 25), not just condom *use*, but all condom-related behaviours required for STI and unwanted pregnancy prevention (section 1.2.1, page 8). The literature suggests that PBC may not be a useful psychological construct in the prediction of condom *use*, but to date little is known about whether this is true for other condom-related behaviours (section 1.3.4, page 27). The main aim of this study was to identify beliefs and condom-related behaviours to be targeted in an online intervention. A second aim of this study was to determine whether different populations differed in the target beliefs identified, or whether a 'one size fits all' intervention was appropriate.

Chapter 4 describes the development, implementation and evaluation of an online safer sex intervention targeting the identified TPB constructs and condom-related behaviours in chapter 3. Persuasive messages delivered online have the potential to reach a wide audience, and in specific populations messages based on psychological constructs of the TPB have been shown to change condom behaviours (section 1.4.2, page 39). However, to date few interventions appear to have been undertaken in a broad population (section 1.2.3, page 14) targeting multiple condom-related behaviours (section 1.4.2, page 39). The main aim of this study was to deliver and evaluate an online safer sex intervention in a broad population by targeting the beliefs found to be most predictive of intention in chapter 3. The second aim of this study was to explore persuasive message framing in relation to changing targeted beliefs. Specifically exploring whether positively- or negatively-framed persuasive messages were better at changing antecedents of, and performance of condom-related behaviours (where applicable), in a broad population compared to a control intervention.

Chapter 5 is a general discussion synthesising the findings from each study. Findings are discussed in relation to the existing body of research, and in relation to the implications for promoting performance of condom behaviours in a general population. Limitations of the research, and opportunities for further research are discussed in relation to the TRA/TPB and online safer sex interventions.

Chapter 2

Accessing, carrying, negotiating use, using and disposing: An exploratory elicitation study of five condom-related behaviours

2.1 Introduction

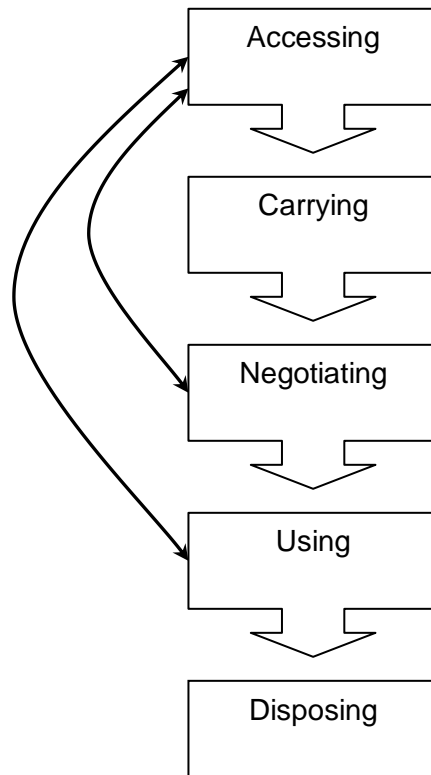
Through a review of the literature in chapter 1, it was suggested that to reduce the number of STIs and unwanted pregnancies, health psychologists need to promote the performance of safer penetrative sex with either male or female condoms, and safer oral sex with either male condoms or dental dams. Socio-cognitive theories of behaviour such as the TRA/TPB have been used to predict condom-related behaviours such as *carrying* (e.g., Armitage and Talibudeen 2010) and *using* (e.g., Carmack and Lewis-Morris 2009). These theories can be useful in helping to design behaviour change interventions (Ajzen 2006a). The TRA/TPB proposes that underlying attitudinal, normative and control beliefs toward a given behaviour are the foundations on which intentions to perform, and actual performance of behaviour are pinned (Ajzen 1991; Sutton et al. 2003). Understanding these underlying beliefs about a certain behaviour, for example *using* condoms, is the first step in being able to design an intervention to change behaviour (Ajzen 2006a; Sutton 2002). To date there appears to be a paucity of literature exploring beliefs toward performing multiple condom-related behaviours in a broad population. Therefore, the purpose of the study described in this chapter was to investigate these beliefs in an elicitation study.

2.1.1 Condom-related behaviours

As highlighted in chapter 1 (section 1.2.1, page 8), the majority of safer sex research has focussed on condom *use* behaviour, yet other condom-related behaviours are important if safer sex is to be performed (Abraham et al. 1992; Bryan, Fisher and Fisher 2002; Fisher, Fisher and Byrne 1977; Hill and Abraham 2008; Moore et al. 2006; 2008). Clearly the actual *use* of a condom will be the behaviour that prevents contracting a STI and unwanted pregnancy. However, it can be argued that safer sex involves 'pre-use', 'use' and 'post-use' behaviours. Pre-use behaviours include *accessing*, *carrying* and *negotiating* condom use. Actual *use* follows, and 'post-use' the *disposal* of the condom is

required. The interconnectivity of condom-related behaviours to enable safer sex is depicted in Figure 2.1.

Figure 2.1: The processes of condom-related behaviours



It is unlikely that the performance of condom-related behaviours follow a strict consecutive order. In Figure 2.1 the bowed arrows between *accessing* and *negotiating*, and *accessing* and *using* reflect this non-consecutive performance. This illustrates that individuals may *access* condoms with the intention of immediate *use*, meaning they would not *carry* a condom for any length of time. Likewise, *negotiation* may lead to immediate *access* and subsequent *use* reflected by the two-way arrow. In addition, males in particular may bypass the need to *negotiate* male condom *use* at all. It is proposed that performance of *access* and *disposal* condom-related behaviours are rigid, with fluidity of movement and necessity between the behaviours preceding *use*. Arguably, there is a need to understand within a TRA/TPB framework the beliefs individuals hold toward performing all five of these condom-related behaviours

(*accessing, carrying, negotiating, using and disposing*; ACNUD) if ultimately an intervention is to be developed to promote effective condom *use*.

2.1.2 Elicitation research

Elicitation studies are used to identify salient beliefs individuals hold toward a given behaviour (Ajzen 2006b). Despite the importance of the elicitation stage of TRA/TPB intervention development, to date, little elicitation research has been published (Sutton et al. 2003). Rigorous database searches suggest there are currently no published elicitation studies of multiple condom-related behaviours.

According to Francis et al. (2004), in order to predict whether an individual intends to perform a behaviour, viewed as the proximal determinant of actual behaviour, (Ajzen 1991), a researcher needs to know the attitudinal, normative and control beliefs of the individual toward the behaviour under consideration. For example; whether an individual is in favour of doing it (attitude), how much the individual feels social pressure to do it (Subjective Norm; SN), and whether the individual feels in control of the behaviour (Perceived Behavioural Control; PBC). These beliefs can be elicited using recommended wording (Ajzen 2006b). However, as argued in chapter 1 (sections 1.3.5 and 1.3.6, pages 28 and 29) the TRA and TPB have been mainly viewed as cognitive theories of behaviour, yet the performance of many health behaviours are influenced by affective responses toward the behaviour (French et al. 2005; Lawton, Conner and McEachan 2009; Trafimow et al. 2004).

Research separating the affective and cognitive component of attitudes toward condom *use* has demonstrated that different beliefs do exist, and the affective component may be more predictive of condom *use* (De Wit, Victoir and Van den Bergh 1997b). Norton et al. (2005) argue that including manipulations of affective beliefs toward condom *use* in interventions is likely to have a greater impact on behaviour change than interventions focussing solely on cognitive beliefs. Furthermore, affective beliefs appear to be more accessible from memory than cognitive beliefs (Verplanken, Hofstee and Janssen 1998),

suggesting they are more likely to drive behaviour (Zajonc 1984). Arguably therefore, it was important that affective as well as cognitive beliefs toward these five condom-related behaviours were explored in the current study.

Ajzen and Fishbein (1980) argue that five to eight salient beliefs in a population will predict the majority of the variance in any behaviour under consideration. The most common beliefs that the population elicit are known as the modal salient beliefs (Ajzen and Fishbein 1980). However, the rules of determining which beliefs are classified as modal and therefore included in the ‘main’ study are vague (Sutton et al. 2003). Various rules have been suggested such as including beliefs mentioned by at least 10 or 20 percent of the population, or choosing 75 percent of all the beliefs elicited (Ajzen and Fishbein 1980; Sutton et al. 2003). However, these methods may fail to include beliefs which although may have only been reported by one individual in an elicitation study, may in a larger population, such as that used in questionnaire studies, become the most predictive of intention (Dean et al. 2006). There may be a need to include all beliefs in a pilot questionnaire study in order to eliminate those which although deemed modal are not actually predictive of intention. This argument is particularly true of beliefs elicited in a broad population, where previous studies have demonstrated that experience with condoms (Yzer, Siero and Buunk 2001), age (Schick et al. 2010), and gender (Sheeran and Orbell 1998), can all influence future condom *use*.

There is also a growing need to explore beliefs about condom-related behaviours in a broad population due to the rise in STIs in older individuals (Bodley-Tickell et al. 2008; Health Protection Agency [HPA] 2012). Similarly, in recent years, the heterosexual population has been largely overlooked in safer sex campaigns (Bowleg 2011; Gredig, Nideroest and Parpan-Blaser 2006), despite incidences of new cases of HIV diagnoses increasing in this group (Haverkos, Chung and Norville-Perez 2003; HPA 2010b; National AIDS Trust 2012). Beliefs toward performing condom-related behaviours other than *use* have also tended only to be explored in younger samples (e.g., Armitage and Talibudeen 2010). Elicitation research arguably needs to explore whether

different populations hold different beliefs toward the full range of condom-related behaviours, as argued in the chapter 1 (section 1.2.3, page 14). This exploration is important for intervention development applicable to a broad population. If different populations hold widely varying beliefs toward condom-related behaviours, then developing a 'one size fits all' intervention may not be appropriate (Noar, Black and Pierce 2009; Stead et al. 2005; Sumartojo et al. 1997).

2.1.3 Analysis of elicitation data

The method recommended to analyse elicitation data is content analysis (Ajzen 2006b; Francis et al. 2004; Godin and Kok 1996). Qualitative studies exploring beliefs under each of the TPB constructs typically adopt a top-down approach to this analysis, meaning the theoretical underpinning guides the analysis rather than the data as in a bottom-up approach (Bayley, Brown and Wallace 2009; French et al. 2005; Patch, Tapsell and Williams 2005). Once themes are generated, content analysis enables the data to also be explored quantitatively (French et al. 2005; Krippendorff 2007; Neuendorf 2002; Sutton et al. 2003; Weber 1990). However, of the published elicitation studies, it is not always clear how themes pertaining to each TPB construct were generated before the quantitative analysis was performed (e.g., Darker et al. 2007), which does not enable other researchers to reproduce the analysis (Yardley 2000). Therefore, this study aimed to outline a reproducible account of how the content analysis was performed.

In chapter 1 of this thesis it was highlighted that one of the criticisms of the TPB is that constructs may not be mutually exclusive (section 1.3.5, page 28). In order to address whether individuals elicit different affective and cognitive behavioural beliefs, French et al. (2005) subjected qualitative elicitation data to proportional analysis. The authors thematically coded their elicitation data, using the same coding frameworks for both the affective and cognitive beliefs. The proportional test for paired samples, recommended by Newcombe and Altman (2000), was used to determine whether some themes were more likely to be elicited as an affective or cognitive belief. Using this test, researchers can

explore at the 95% confidence interval level the difference between the proportion of individuals who elicit both an affective and cognitive belief, and individuals who only elicit either an affective or cognitive belief. The test reports whether these differences are significant at the 5% level. Findings from the French et al. (2005) study applying this analysis suggested that for some themes, individuals elicited behavioural beliefs as both an affective and cognitive belief, but for other themes these were more likely to be elicited as either an affective or cognitive belief. This approach to exploring differential responding to affective and cognitive belief elicitation appears to have only been applied to physical activity behaviour (Darker et al. 2007; French et al. 2005; Sutton et al. 2003). Therefore, to explore whether some behavioural beliefs toward the full range of condom-related behaviours are more likely to be elicited as either an affective or cognitive attitude, the current data was subjected to proportional analysis.

Studies such as those cited above appear to have a two-stage approach to analysis. First, data is content analysed to create themes. Second, these themes are subjected to proportional analysis. This two-stage approach appears to be required to overcome the difficulties with small numbers of reoccurring beliefs being elicited. Therefore, content analysis into themes provides researchers with a larger number of beliefs per theme so that proportional analysis can be performed (French et al. 2005). Although Norton et al. (2005) argue that affective beliefs are more important targets for condom *use* interventions than cognitive beliefs, this study needed to establish whether individuals distinguished between affective and cognitive beliefs for five condom-related behaviours. Arguably therefore, this two-stage approach to elicitation data analysis was adopted for the present study as it appears not to have been previously applied to exploring beliefs toward multiple condom-related behaviours.

The literature also suggests that if an individual holds negative beliefs toward a given behaviour, these beliefs may inhibit subsequent performance of the behaviour (Darker et al. 2007; De Wit, Victoir and Van den Bergh 1997b; Norton

et al. 2005). Sutton (2002) argues that changing underlying negative beliefs to positive beliefs is likely to strengthen an individual's intention to perform a behaviour. For example, if individuals hold a negative belief that *using* a condom will interrupt the sexual act. This belief may be reframed so that individuals believe that although *using* the condom is likely to interrupt the sexual act, condom *use* will prevent them and their sexual partner from contracting a STI and interrupting the sexual act may actually contribute to building sexual excitement (a positive belief). In an elicitation study about walking behaviour, Darker et al. (2007) explored the number of positive and negative beliefs (belief valence) that individuals elicited in response to different TPB elicitation questions using MANOVA analysis. Findings suggested that individuals generated more positive attitudinal and normative beliefs than negative beliefs for these TPB constructs. However, more negative control beliefs appeared to be generated. No differences were found between genders, or age groups, which were split by younger and older individuals.

In terms of condom-related behaviours, there is research which explores belief valence, but only in relation to the attitude TPB construct (e.g., Dahl et al. 2006). There appears to be few studies that explore valence of beliefs toward condom-related behaviours for all three TPB constructs (e.g., Giles, Liddell and Bydawell 2005), and none which explore belief valence in relation to five condom-related behaviours in one study. As Casey et al. (2009) acknowledge; understanding condom *use* attitudinal, normative and control belief valence are all important elements for designing successful behaviour change interventions. This is because an “individual needs to regard condom use positively, to believe that one can utilize a condom and that a condom will avert the threat with little social cost” (Casey et al. 2009:58). Therefore, this elicitation study explored belief valence towards all five condom-related behaviours important for safer sex to be achieved, and for all psychological constructs of the TPB.

2.1.4 Purpose of the study

This elicitation study used an extended TPB framework to explore affective, cognitive, normative, and control beliefs of a broad population toward five

condom-related behaviours. The study had two aims (see also section 1.6.2, page 50). The first aim was to elicit extended TPB beliefs toward five condom-related behaviours, which is the first stage in TPB-based intervention development (Ajzen 2006a; Sutton 2002; section 1.6.1, page 49). It was expected that these beliefs would then be used to develop a questionnaire to explore in the planned intervention target population which beliefs are most predictive of intention to perform these five condom-related behaviours (Ajzen 2006b; sections 1.3.3 and 1.6.1, pages 25 and 49). The second aim was to determine whether a broad population sample of all ages and backgrounds would respond to an online survey. Although it was argued in chapter 1 (sections 1.4.3 and 1.5.2, pages 42 and 47) that taking an online approach to exploring condom-related behaviours may reduce embarrassment individuals report when discussing sexual health with HCPs face-to-face, and socially desirable responding; the researcher needed to determine whether a broad range of individuals would respond to an online survey, bearing in mind that data suggests the largest proportion of internet users are aged between 16 and 24 years old (Office for National Statistics [ONS] 2011a). If a broad range of individuals did not respond to the online survey, then an online approach may not have been feasible for subsequent studies in this thesis.

In addition, based on literature reviewed in the introduction of this chapter, and chapter 1 (e.g., section 1.3.5, page 28), it was expected that (1) some behavioural beliefs toward these five condom-related behaviours were more likely to be elicited as either an affective or cognitive belief, (2) individuals were likely to elicit different numbers of positive and negative affective, cognitive, normative and control beliefs depending on the condom-related behaviour being considered, and (3) different populations were likely to elicit different numbers of affective, cognitive, normative and control beliefs toward different condom-related behaviours.

2.2 Method

2.2.1 Design

This elicitation study used online survey techniques. Participants answered open-ended questions, which were grounded in the TPB (Appendix 1: Copy of survey). Online elicitation was chosen for three reasons. First, traditional one-to-one interviews and focus groups techniques can take considerable time to organise, undertake, and transcribe afterwards (Sommer and Sommer 1997). Due to the broad range of populations being sampled in this study it was not deemed feasible to use traditional qualitative data collection methods such as one-to-one interviews. Second, health psychologists are increasingly using the Internet as a tool for health research to capture beliefs from diverse populations (Kraft and Yardley 2009). Third, traditional interview techniques are prone to bias where participants may respond in socially acceptable ways to please the researcher (Dyer 1995). The use of anonymous online survey techniques may help to reduce this tendency.

2.2.2 Participants

Convenience sampling was used to recruit to the study. This non-probability sampling method has been widely used in exploratory research (Sommer and Sommer 1997). Seven populations were sampled; individuals aged 17 years and younger, university students, university staff, LGBT (lesbian, gay, bisexual and transgender) individuals, individuals aged 60 years and older, health care professionals and general adults (aged between 18 and 59 years of age). Forty-four participants accessed the online survey and twenty-six completed the TPB elicitation questions. Table 2.1 (page 62) shows the demographic characteristics of the whole sample, those that completed only the demographics section, and those who completed the TPB elicitation questions.

Representativeness check

Data were re-grouped for analysis purposes as some demographic samples had only one individual assigned to the group (Field 2009; Tabachnick and Fidell 1996) (Appendix 2: Data re-grouping categories). Chi-square analysis was undertaken on those who did and did not complete the TPB section. No

differences were detected in terms of gender ($\chi^2(1) = 0.63$, $p = .80$), education level ($\chi^2(1) = 0.38$, $p = .38$), ethnicity ($\chi^2(1) = 0.24$, $p = .63$), sexual orientation ($\chi^2(1) = 3.11$, $p = .08$), or relationship status ($\chi^2(1) = 0.36$, $p = .55$). A t -test was undertaken to determine whether age differences were present, no differences were found ($t(42) = 1.57$, $p = .12$). No comparisons were undertaken on sexual experience due to the majority of the sample being non-virgins.

Table 2.1: Demographic comparisons of TPB questionnaire completers and non-completers

Demographic		Whole sample (n=44)	Completers (n=26)	Non-completers (n=18)
Age	Mean	35.57 years	40.73 years	33.00 years
	SD	16.30 years	17.49 years	13.60 years
Gender	Female (%)	23 (52.3)	14 (53.8)	9 (50.0)
	Male (%)	21 (47.7)	12 (46.2)	9 (50.0)
Education	Degree level (%)	31 (70.5)	17 (65.4)	14 (77.8)
	Below degree (%)	13 (29.5)	9 (34.6)	4 (22.2)
Ethnicity	Caucasian (%)	38 (86.4)	23 (88.5)	15 (83.3)
	Non- Caucasian (%)	6 (13.6)	3 (11.5)	3 (16.7)
Sexual Orientation	Heterosexual (%)	35 (79.5)	23 (88.5)	12 (66.6)
	Gay male (%)	5 (11.4)	2 (7.7)	3 (16.7)
	Lesbian (%)	4 (9.1)	1 (3.8)	3 (16.7)
Relationship status	In a relationship (%)	27 (61.4)	15 (57.7)	12 (66.7)
	Not in a relationship (%)	17 (38.6)	11 (42.3)	6 (33.3)
Sexual Experience	Virgin (%)	2 (4.5)	2 (7.7)	0 (0.0)
	Non-Virgin (%)	42 (95.5)	24 (92.3)	18

2.2.3 Measures

Demographics

Age, gender, ethnicity, highest level of education, sexual orientation, relationship status and sexual experience were collected as these factors have been found to influence salient beliefs (Sheeran et al. 1990).

Theory of Planned Behaviour belief measures

Elicitation questions used Ajzen's (2006b) recommended wording to ask participants about;

- advantages and disadvantages of performing each of the five condom-related behaviours (cognitive beliefs),
- individuals who would approve and disapprove each of the five condom-related behaviours (normative beliefs),
- circumstances that would enable or make it difficult to carry out each of the five condom-related behaviours (control beliefs).

Questions to elicit affective beliefs used like and dislike questions as recommended by French et al. (2005) (Appendix 1: Copy of survey). In total, eleven questions were used to elicit extended TPB beliefs, as Ajzen (2006b) recommends that for each TPB construct a question to elicit 'any other beliefs' is included. Yet, French et al. (2005) do not suggest this approach for affective beliefs. Each elicitation question had a text box to respond to each of the condom-related behaviours as shown in Figure 2.2.

Figure 2.2: Elicitation question and response format

9. What things would you dislike about	
Disposing of condoms?	<input type="text"/>
Using condoms?	<input type="text"/>
Accessing condoms?	<input type="text"/>
Carrying condoms?	<input type="text"/>
Negotiating with a partner to use condoms?	<input type="text"/>

Previous performance of condom-related behaviours

Five questions asked if individuals had ever performed each of the condom-related behaviours and if so how undertaking these behaviours made them feel. This was done to further elicit any other affective beliefs, similar to the 'any other belief' measures recommended by Ajzen (2006b) for the standard TPB constructs.

2.2.4 Procedure*Piloting of the survey*

Initially two versions of the online survey were created; one version consisted of five pages of elicitation questions, one per condom-related behaviour. The other version had one page of elicitation questions, and under each question there were five spaces for participants to be able to provide their beliefs toward each condom-related behaviour. The links to both versions were emailed to two individuals not connected to the research for their feedback on preferred layout. Both preferred the second layout as it felt shorter; therefore, the single page survey was used for the elicitation study.

Main elicitation study procedure

Ethical approval was obtained from the Faculty of Health and Life Sciences at Coventry University before data collection commenced (Appendix 3: Ethical approval). Recruitment took place over two calendar months. Seven online surveys were created, one for each population (section 2.2.2, page 61), in order for the researcher to identify how many responses from each population had been obtained. Potential participants were emailed a link to the survey. A reminder email was sent two weeks later stating that as the data was anonymous the researcher did not know whether the participant had completed the survey or not. All participants accessing the survey created a unique personal identifier based on the day and month of their birth, and the first three letters of their mother's maiden name e.g. 20/02/FUR. This allowed for anonymous withdrawal of data should it be requested by a participant. Data

were downloaded daily into excel, and merged into a password-protected file containing all participants responses.

When participants clicked on the link to the survey they were presented with the participant information sheet and consent procedure, before being given survey instructions (Appendix 1: Copy of survey). These instructions had definitions of different sexual orientations and sexual experience to aid participants in choosing the category that best described them. Pictures of the three ‘types’ of condoms were then presented (chapter 1, section 1.1, page 1). Participants were asked to pick the method they were most likely to use and respond to items with this method in mind. The TPB elicitation questions followed, a thank you page, and a participant debrief sheet which contained information about where they could obtain further sexual health support followed that. The final page contained a space for participants to enter their email address if they wished to receive information about future research. Participant anonymity was maintained as any email addresses were removed from the data file and saved in a separate password-protected excel file.

Reducing response fatigue

The question responses to each of the five condom-related behaviours were set to appear in a random order in an attempt to reduce response fatigue (Figure 2.2, page 63) (Streiner and Norman 2008). Although participants were warned some questions might seem similar to one another, counterbalancing was used to reduce the possibility of participants responding in the same manner to the different condom-related behaviours. This was achieved by setting the order of the condom-related behaviours to appear randomly for each question.

2.2.5 Data Analysis

A series of analyses were conducted on the elicitation data.

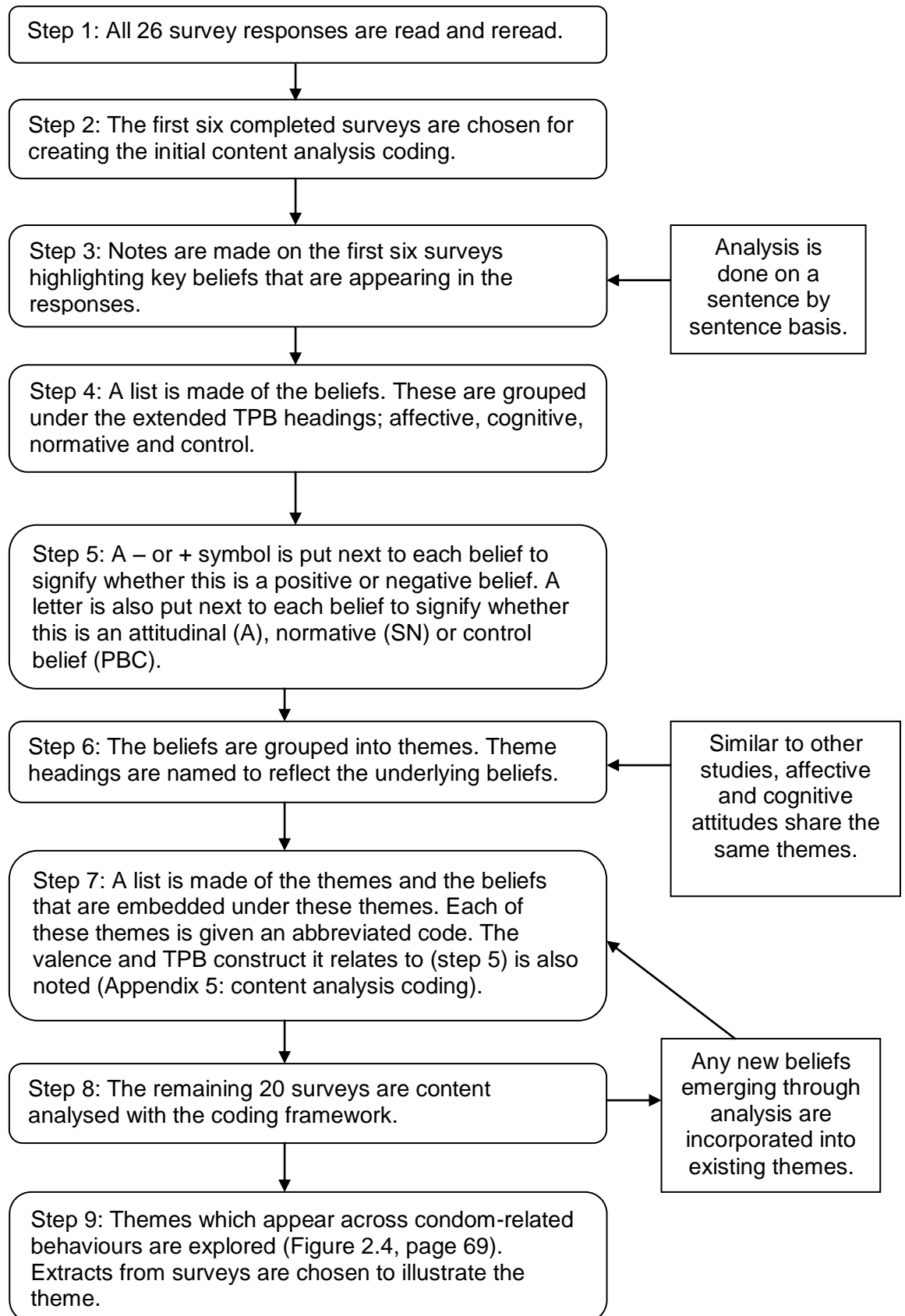
Qualitative

First, content analysis was undertaken on a sentence level (Weber 1990), as some individual's elicited only one belief in response to the elicitation question (Appendix 4: Example of beliefs data). The beliefs elicited were read and reread to gain an overview of the beliefs being generated for each condom-related behaviour. Thematic coding frameworks were developed for each TPB construct using the first six surveys (Mayring 2001) (Appendix 5: Content analysis coding). The same coding framework was used for the affective and cognitive attitudes elicitation questions (French et al. 2005). One researcher created the themes based on beliefs that shared commonality (Krippendorff 2007). In order to reduce bias and address credibility, themes were verified by another researcher specialising in sexual health research (Cook 2012; Graneheim and Lundman 2004). The content analysis process is depicted in Figure 2.3 (page 67) (Hale, Grogan and Willott 2010).

Quantitative

In order to test the first hypothesis (section 2.1.4, page 59), attitudinal themes generated from the content analysis (section 2.3.1, page 68) were subjected to paired sample proportional analysis using the Confidence Interval Analysis software and test recommended by Newcombe and Altman (2000) (French et al. 2005) (section 2.3.2, page 87). To test the second hypothesis (section 2.1.4), a 2 (belief valence: positive versus negative) x 5 (condom-related behaviour: ACNUD) MANOVA was performed on the mean number of beliefs generated for each of the five condom-related behaviours (Darker et al. 2007) (section 2.3.3, page 89). Finally, to test the third hypothesis (section 2.1.4), a 4 (population: YM, OM, YF, OF) x 8 (elicitation question: like, dislike, advantage, disadvantage, approve, disapprove, enable, inhibit) MANOVA was performed (Darker et al. 2007) (section 2.3.4, page 92).

Figure 2.3: Diagrammatic representation of content analysis process



2.3 Results

2.3.1 *Content analysis*

In order to fulfil the first aim of the study, to identify beliefs individuals hold which could be used in a subsequent questionnaire study, and to create themes, so that proportional analysis could be undertaken on the affective and cognitive beliefs in order to test hypothesis one (section 2.1.4, page 59), the open-ended survey responses were subjected to content analysis.

Across condom-related behaviours a number of common major themes were present. These are shown in Figure 2.4 (page 69). These major themes and the subthemes are discussed in detail below (pages 70 to 87). Briefly, in terms of attitudes twelve themes emerged; three of these were exclusively in response to advantage/like questions; five exclusive to disadvantage/dislike questions and four themes generated both positive and negative beliefs. Nine themes emerged for SN; four of these were exclusively in response to the approval question; one exclusive to the disapproval question and five themes were both individuals who would approve and disapprove of performing these condom-related behaviours. PBC elicitation questions produced seven themes; one theme was exclusively in response to things that would enable performance of condom-related behaviours, the other six themes were both enablers and inhibitors of condom-related behaviours.

Figure 2.4: Themes appearing across condom-related behaviours (*Accessing, Carrying, Negotiating, Using, Disposing*) grouped by TPB construct

Affective and Cognitive Attitudes

Advantages/Likes

Theme	A	C	N	U	D
Self Perceptions	✓	✓	✓	✓	✓
Impact on Sexual Act	✗	✓	✓	✗	✓
Practical Issues	✓	✓	✓	✗	✗
Prevent Pregnancy/STI	✓	✓	✓	✓	✗
Safe	✓	✓	✓	✓	✓
Partner	✓	✓	✓	✓	✓
Physical Impact	✗	✗	✗	✓	✓

Disadvantages/Dislikes

Theme	A	C	N	U	D
Embarrassment	✓	✓	✓	✓	✓
Impact on Sexual Act	✓	✗	✓	✓	✓
Practical Issues	✗	✓	✗	✗	✗
Partner	✗	✗	✓	✓	✗
Condom Issues	✓	✓	✗	✓	✗
Physical Disposal	✗	✗	✗	✗	✓
Physical Feel	✗	✗	✗	✗	✓

Subjective Norm

Approve

Theme	A	C	N	U	D
Health Care Professionals	✓	✓	✓	✓	✓
Partner	✓	✓	✓	✓	✓
Parents	✓	✓	✓	✓	✓
Family	✓	✓	✓	✓	✓
Friends	✓	✓	✓	✓	✓
Condom Companies	✓	✗	✓	✓	✗
Safer Sex Charities	✓	✓	✓	✓	✗

Disapprove

Theme	A	C	N	U	D
Partner	✓	✓	✓	✓	✓
Culture	✓	✓	✓	✓	✓
Parents	✗	✗	✓	✗	✗
Family	✗	✗	✗	✓	✓
Owners	✗	✗	✗	✗	✓

Perceived Behavioural Control

Enable

Theme	A	C	N	U	D
Situational	✓	✓	✓	✓	✗
Physical Relationship	✓	✓	✓	✓	✗
Status	✓	✓	✓	✗	✗
Self Perceptions	✓	✓	✓	✓	✗
Partner	✗	✓	✓	✓	✓
Environment	✗	✗	✗	✗	✓

Inhibit

Theme	A	C	N	U	D
Situational	✓	✓	✓	✓	✗
Culture	✓	✓	✓	✗	✓
Partner	✓	✓	✓	✓	✗
Physical	✗	✓	✓	✗	✗
Self Perceptions	✗	✓	✗	✗	✗
Environment	✗	✗	✗	✗	✓

Attitudes

A number of themes emerged that were elicited in response to like/advantage and dislike/disadvantage questioning. This highlights the complex nature of condom-related behaviours, as both positive and negative attitudes may be held in relation to performance of these behaviours. Some themes appeared to be unique to a particular behaviour and type of elicitation question asked. The emergent themes are reported (e.g., Partner for theme heading, then 'partner' under discussion of theme) in relation to the beliefs elicited, and the question wording that elicited these beliefs. The actual beliefs individuals elicited and the condom-related behaviour these beliefs relate to are denoted by italics (e.g., *easy*).

Partner

Condom-related behaviours involve the sexual 'partner', and the influence of one's 'partner' in both affective and cognitive attitudes was a pervasive theme across all five condom-related behaviours (Figure 2.4, page 69). Both like/advantage and dislike/disadvantage outcome beliefs were elicited related to one's 'partner'. Tables 2.2 and 2.3 (pages 72 and 73) show the percentages of beliefs relating to the 'partner' theme elicited in response to the question asked and behaviour under consideration. This highlights the fact that condom-related behaviours involve liaison between two individuals, which are perceived as having both positive and negative outcomes. For example, participant 11 stated in relation to *negotiating* condom use, "it shows good sense and compassion", yet participant 7 stated, "it (*negotiating*) can sometimes cause confrontation."

There were a number of beliefs elicited in response to the like/advantage questions relating to one's 'partner'. The belief that you appear *responsible* to your 'partner' because you perform these condom-related behaviours was elicited as an affective belief for *negotiating* and *disposing* behaviours. In addition, appearing *responsible* to your 'partner' was also elicited as a cognitive belief for *accessing* and *carrying* behaviours. Other affective beliefs elicited for *negotiating* behaviour, relating to one's 'partner' were; feeling *trustworthy*,

feeling *open* and feeling *mature*. For *carrying* behaviour, two further cognitive beliefs pertaining to one's 'partner' were elicited; *demonstrating compassion* and *getting to have sex*.

The dislike/disadvantage outcome beliefs relating to one's 'partner' were mainly elicited in relation to *negotiating* behaviour. Affective beliefs were generated in relation to 'partner' reactions; feelings that *arguments* may be caused, and *fear of partner's reactions* to *negotiating* condom use. The cognitive belief elicited was potentially knowing that a male 'partner' may not *like negotiating* condom use (and potentially actually *using* condoms). Only one other belief for *using* behaviour was elicited, this was an affective belief that *confrontation* may occur as a result of performing this behaviour.

Self Perceptions

The theme of 'self perceptions' was obtained across all five condom-related behaviours in response to the like/advantage questions (Figure 2.4, page 69). Tables 2.2 and 2.3 (pages 72 and 73) show the percentages of beliefs relating to the 'self perceptions' theme elicited in response to the question asked and behaviour under consideration. For some participants 'self perceptions' consisted of more than one belief, for example, in response to being asked about what you would like about *accessing* condoms participant 7 reported, "independence and control of my own sexual health." For *accessing* behaviour, affective beliefs elicited were that responders felt the behaviour was *easy to perform* and they had a *choice about where to access* condoms. The cognitive belief elicited for *accessing* condoms was that it *gave an individual independence*. *Control of accessing* condoms was elicited as both an affective and cognitive belief, feeling in *control* and actually having *control* of where and how condoms are *accessed*.

Table 2.2: Number of participants who gave responses in each category for the advantages (Adv) and like questions by condom-related behaviour

Theme	Accessing		Carrying		Negotiating		Using		Disposing	
	Adv	Like	Adv	Like	Adv	Like	Adv	Like	Adv	Like
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Safe	3 (11.5)	3 (11.5)	6 (23.1)	2 (7.7)	3 (11.5)	1 (3.8)	12 (46.2)	14 (53.8)	0 (0.0)	2 (7.7)
Self Perceptions	5 (19.2)	8 (30.8)	0 (0.0)	3 (11.5)	5 (19.2)	1 (3.8)	2 (7.7)	0 (0.0)	5 (19.2)	2 (7.7)
Practical Issues	2 (7.7)	2 (7.7)	8 (30.8)	9 (34.6)	0 (0.0)	2 (7.7)	N/A	N/A	N/A	N/A
Prevent pregnancy/STI	6 (23.1)	0 (0.0)	8 (30.8)	0 (0.0)	7 (26.9)	0 (0.0)	12 (46.2)	0 (0.0)	N/A	N/A
Partner	1 (3.8)	0 (0)	3 (11.5)	0 (0.0)	9 (34.6)	9 (34.6)	1 (3.8)	0 (0.0)	5 (19.2)	1 (3.8)
Impact on sexual act (IOSA)	N/A	N/A	1 (3.8)	0 (0.0)	0 (0.0)	1 (3.8)	N/A	N/A	4 (15.4)	0 (0.0)
Physical impact	N/A	N/A	N/A	N/A	N/A	N/A	3 (11.5)	2 (7.7)	6 (23.1)	3 (11.5)
No response	12 (46.2)	13 (50.0)	8 (30.8)	12 (46.2)	6 (23.1)	12 (46.2)	11 (42.3)	10 (38.5)	9 (34.6)	18 (69.2)

Note: N/A signifies that this theme was not present for the condom-related behaviour

Table 2.3: Number of participants who gave responses in each category for the disadvantages (DisA) and dislike questions by condom-related behaviour

Theme	Accessing		Carrying		Negotiating		Using		Disposing	
	DisA	Dislike	DisA	Dislike	DisA	Dislike	DisA	Dislike	DisA	Dislike
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Embarrassment	0 (0.0)	9 (36.4)	0 (0.0)	5 (19.2)	0 (0.0)	4 (15.4)	0 (0.0)	2 (7.7)	0 (0.0)	5 (19.2)
Impact on sexual act (IOSA)	0 (0.0)	4 (15.4)	N/A	N/A	7 (26.9)	8 (30.8)	3 (11.5)	12 (46.2)	0 (0.0)	3 (11.5)
Self Perceptions	4 (15.4)	11 (42.3)	10 (38.5)	7 (26.9)	N/A	N/A	N/A	N/A	N/A	N/A
Condom Issues	2 (7.7)	0 (0.0)	1 (3.8)	0 (0.0)	N/A	N/A	3 (11.5)	1 (3.8)	N/A	N/A
Practical Issues	N/A	N/A	5 (19.2)	0 (0.0)	N/A	N/A	N/A	N/A	N/A	N/A
Culture	N/A	N/A	4 (15.4)	0 (0.0)	2 (7.7)	0 (0.0)	N/A	N/A	N/A	N/A
Partner Reactions	N/A	N/A	N/A	N/A	6 (23.1)	5 (19.2)	0 (0.0)	2 (7.7)	N/A	N/A
Physical Feel	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5 (19.2)	7 (26.9)
Physical Disposal	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5 (19.2)	3 (11.5)
No response	20 (76.9)	7 (26.9)	12 (46.2)	14 (53.8)	14 (53.8)	14 (53.8)	20 (76.9)	9 (36.4)	16 (61.5)	11 (42.3)

Note: N/A signifies that this theme was not present for the condom-related behaviour

In response to the dislike/disadvantage questions the ‘self perceptions’ theme was only present for *accessing* and *carrying* behaviour. Both affective and cognitive beliefs were elicited. Participants felt that *others judged* them when these behaviours were performed but also knew others were *likely to judge them*, for example participant 7 stated in relation to *accessing* condoms and being judged by others, “if there are big queues like in Tesco’s and they are on the conveyer belt.” For *accessing* behaviour, two further affective beliefs were elicited; feeling *uneasy* and feeling *self-conscious*. *Carrying* behaviour elicited one further affective belief, feeling *presumptuous* when you *carry* condoms that you are going to have sex. *Carrying* also elicited the cognitive belief that you would potentially be viewed as a *cheat* if you *carried* condoms, as this may give you the opportunity to have sexual intercourse with someone other than your partner as participant 13 noted, “(it) may encourage cheating.”

Impact on sexual act (IOSA)

The ‘IOSA’ theme was elicited in response to the like/advantage and dislike/disadvantage questions (Figure 2.4, page 69). Tables 2.2 and 2.3 (pages 72 and 73) show the percentages of beliefs relating to the ‘IOSA’ theme elicited in response to the question asked and behaviour under consideration. Often condom-related behaviours, particularly condom *use*, are seen to negatively impact on the sexual act, yet in this sample a small number of positive impacts were elicited. A cognitive belief relating to *carrying* condoms was that it may actually help with *spontaneity* as *carrying* condoms allows the sexual act to occur when the opportunity arises. Similarly, the affective belief that feelings of *anticipation* may be produced through *negotiating* condom use was elicited. The cognitive belief that if a male condom was *used*, it was a *man’s job* to *dispose* of it, was elicited as an advantage of condom *disposal* by a female participant.

A number of negative beliefs about ‘IOSA’ were elicited for *accessing*, *negotiating*, *using* and *disposing* behaviours. For *accessing*, *negotiating*, *using* and *disposing* behaviours, the affective belief that performing these condom-related behaviours may be *awkward* was elicited. For *negotiating* behaviour,

two other affective beliefs were elicited, feeling *unromantic* and feeling *turned off*. Two further cognitive beliefs were elicited for *negotiating* behaviour, it impacts on the sexual act as it is *less intimate*, and *negotiation* may *ruin the mood*, as participant 6 stated, “(it) creates a pause or break just before sex, might ruin the mood.” For *using* behaviour, two further affective beliefs were elicited; *using* condoms can be *nerve wracking*, cause *loss of sensation* and *spontaneity*. Cognitive *using* beliefs elicited were that it is difficult to *demonstrate* how to *use* a condom, and condom *use* may be viewed as a *forceful* behaviour, as the individual may be seen as *presuming* they were going to have sexual intercourse, both negatively impacting on the sexual act. *Disposing* behaviour also produced the affective belief that this behaviour was *unromantic* as the behaviour needs to be performed soon after the sexual act as participant 8 stated, “it’s something that needs to be done pretty soon after sex, so again, slightly detracts from the moment.”

Safe

Analysis showed that across all condom behaviours the ‘safe’ theme was elicited as both a cognitive and affective belief for all five condom-related behaviours (Figure 2.4, page 69). Tables 2.2 and 2.3 (pages 72 and 73) show the percentages of beliefs relating to the ‘safe’ theme elicited in response to the question asked and behaviour under consideration. This theme was only elicited in response to like/advantage questions. Individuals reported feeling ‘safe’ from performing these condom-related behaviours, but also had knowledge that they will more likely to be ‘safe’ for example, participant 24 stated “being able to improve safety during intercourse.” Sub-beliefs under the ‘safe’ theme included affective beliefs of having *peace of mind* by *carrying* condoms, feeling *happy* from *using* condoms, as well as the cognitive belief of *protecting oneself* by *carrying* condoms. These beliefs suggest that individuals are aware of the benefits of performing these condom-related behaviours, in that they help to reduce the chance of STIs, unwanted pregnancy, and enhance positive feelings of safety.

Embarrassment

Across all five condom-related behaviours, ‘embarrassment’ was elicited as an affective belief (Figure 2.4, page 69). Table 2.3 (page 73) shows the percentages of ‘embarrassment’ beliefs elicited. This theme was only elicited in response to negatively framed dislike/disadvantage questions. *Accessing* and *carrying* condoms may be viewed as ‘embarrassing’ as participant 16 stated, “if you happen to drop one in public.” Similarly *negotiating*, *using* and *disposing* behaviours were perceived as potentially causing ‘embarrassment’ for an individual to perform.

Prevent pregnancy/Sexually Transmitted Infections

Participants generated the belief that performing four of the five condom-related behaviours (*accessing*, *carrying*, *negotiating* and *using*) would ultimately prevent unwanted pregnancy and STIs. This belief was only elicited as a cognitive attitude in response to the advantages question (Figure 2.4, page 69). Table 2.2 (page 72) shows the percentages of beliefs relating to the ‘prevent pregnancy/sexually transmitted infections’ theme. Elicitation of this belief suggests that the knowledge of what condoms are designed to do is known in this broad population. However, only one participant specifically stated that condoms may be used as a form of contraception. Participants tended to report their belief as *prevent pregnancy/STI* demonstrating an understanding that performing condom-related behaviours serve a dual purpose.

Practical issues

Three condom-related behaviours, *accessing*, *carrying* and *negotiating* elicited both affective and cognitive beliefs, grouped under the theme of ‘practical issues’ in response to the like/advantage and disadvantage questions (Figure 2.4, page 69). Tables 2.2 and 2.3 (pages 72 and 73) show the percentages of beliefs relating to the ‘practical issues’ theme elicited in response to the question asked and behaviour under consideration. For *accessing* behaviour participants liked the fact that condoms could be obtained from machines. A cognitive belief was also elicited in relation to *accessing* condoms; that

(*accessing*) was a *convenient* thing to do, participant 7 stated, “I know that there are always condoms available.” For *carrying* condoms, the belief in being *prepared* by performing this behaviour was elicited as both an affective belief in feeling *prepared* and a cognitive belief in knowing you will be *prepared* for sexual intercourse if the opportunity arises. Two further affective beliefs were elicited for *carrying* behaviour; feeling that *carrying* condoms was a *functional* thing to do, and that they are *discrete* to carry, as participant 21 noted, “discrete, non identifiable.” For *negotiating* behaviour, an affective belief was elicited; participants felt that this was a *necessary* behaviour to perform. Cognitive beliefs were elicited in response to the disadvantage question for *carrying* behaviour; participants reported that *carrying* condoms *take up space in wallets/handbags*, and if not used there is a risk of *expiry* or worse, *breakage*, as participant 6 stated, “they might get broken when carrying in the purse and then would not be safe anymore.”

Condom issues

Three condom-related behaviours, *accessing*, *carrying* and *using* elicited both affective and cognitive beliefs, grouped under the theme of ‘condom issues’ in response to the dislike/disadvantage questions (Figure 2.4, page 69). Table 2.3 (page 73) shows the percentages of beliefs relating to the ‘condom issues’ theme elicited. Cost of condoms was elicited as a cognitive belief for *accessing* and *carrying* behaviours. Participants were aware that if they needed to pay for condoms they were *not cheap*, participant 26 stated in relation to *accessing* condoms they disliked, “the increasing cost of bar/club condom prices.” For *using* behaviour, the affective belief that condoms *smelt* was elicited, for example participant 20 stated, “(the) smell of rubber.” *Reliability* was also elicited as a cognitive belief for *using* behaviour, with participants aware that condoms are not 100% reliable to protect from unwanted pregnancy and STIs

Physical impact

The ‘physical impact’ theme was only present for *using* and *disposing* behaviours, in response to the like/advantages questions (Figure 2.4, page 69).

Table 2.2 (page 72) shows the percentages of beliefs relating to the ‘physical impact’ theme elicited. This theme differed from the ‘practical issues’ and ‘IOSA’ themes, as the affective and cognitive beliefs raised for *using* behaviour was that it meant that it enabled sex to be *cleaner*. For *disposing* behaviour, *cleanliness* was only elicited as an affective belief. One other cognitive belief elicited for condom *disposal* was that it was a *hygienic* behaviour to perform, although participant 15 questioned, “if this is ever included in sex education issues, safe hygienic disposal.”

Culture

The ‘culture’ theme was present for *carrying* and *negotiating* behaviours. Beliefs were elicited as either *culture* or *religion* in response to the disadvantage question (Figure 2.4, page 69). Table 2.3 (page 73) shows the percentages of beliefs relating to the ‘culture’ theme elicited in response to the question asked and behaviour under consideration. For some participants this was referred to as a *societal culture* of when they were younger, as participant 15 stated, “...it was unusual in the culture of my days, even doctors would not discuss sex with single women.” Other participants reported that *cultural* and/or *religious* beliefs may prevent them from *carrying* condoms, or *negotiating* condom use. Interestingly it was only females who elicited the cognitive cultural and/or religious beliefs.

Physical disposal and physical feel

Two further themes were only present for *disposing* behaviour, ‘physical disposal’ and ‘physical feel’ (Figure 2.4, page 69). Table 2.3 (page 73) shows the percentages of beliefs relating to the ‘physical disposal’ and ‘physical feel’ themes elicited. These themes were only elicited in response to the dislike/disadvantage questions. The theme ‘physical disposal’ included affective beliefs concerning the best *time* to dispose of the condom after sexual intercourse, alongside feelings about *getting caught having sex* from *disposing* of a *used* condom. Participant 6 stated, “when you are younger its strange, e.g. throwing it away at home and thinking your parents might see it in the bin.” The

cognitive belief elicited for the ‘physical disposal’ theme was that it was necessary to have a *place to dispose* of a *used* condom. Under the ‘physical feel’ theme, the affective belief elicited was that *used* condoms felt *unpleasant* as participant 8 stated, “it’s not the most pleasant task in the world.” Cognitive beliefs elicited were that *used* condoms were *dirty* and felt *strange*, participant 7 stated, “I don’t like touching used condoms.” Although *disposal* of a used condom is a necessary part of safer sex, participant 22 felt that *disposing* of a used condom made them, “..feel grubby in a stereotypically, English repressed, fashion.”

Summary of elicited attitudinal beliefs

It appears that there are a range of affective and cognitive beliefs toward performing these five condom-related behaviours within a broad population sample. More themes relating to the beliefs individuals hold about the dislikes and disadvantages of performing these condom-related behaviours were elicited, than themes pertaining to the likes and advantages of performing the five condom-related behaviours. However, across condom-related behaviours it appears that more like/advantages themes are salient for multiple behaviours, whereas dislikes/disadvantages themes are often expressed in relation to one or two condom-related behaviours. Across all themes, some participants elicited multiple affective and cognitive beliefs regarding the condom-related behaviour under consideration, whilst others elicited no attitudinal beliefs toward the condom-related behaviour.

Subjective Norm

Participants generated a range of referent groups perceived as approving of the five condom-related behaviours; *health care professionals* (HCPs), *one’s sexual partner*, *parents*, *other family members* and *friends* (Figure 2.4, page 69). Normative beliefs elicited were not grouped by theme, rather it was a statement of the referent that would approve or disapprove of the condom-related behaviour. The number and percentage of participants who elicited each referent are shown in Table 2.4 (page 80).

Table 2.4: Number of participants who gave responses in each category for the approval and disapproval questions by condom-related behaviour

Referent	Question	Accessing n (%)	Carrying n (%)	Negotiating n (%)	Using n (%)	Disposing n (%)
HCP	Approve	8 (30.8)	7 (26.9)	8 (30.8)	9 (34.6)	6 (23.1)
Partner	Approve	7 (26.9)	6 (23.1)	6 (23.1)	2 (7.7)	7 (26.9)
	Disapprove	1 (3.8)	3 (11.5)	1 (3.8)	7 (26.9)	N/A
Parents	Approve	4 (15.4)	5 (19.2)	6 (23.1)	6 (23.1)	4 (15.4)
	Disapprove	N/A	N/A	1 (3.8)	N/A	N/A
Family	Approve	3 (11.5)	4 (15.4)	6 (23.1)	5 (19.2)	N/A
	Disapprove	N/A	N/A	N/A	1 (3.8)	1 (3.8)
Friends	Approve	5 (19.2)	6 (23.1)	5 (19.2)	4 (15.4)	3 (11.5)
Condom Companies	Approve	2 (7.7)	N/A	1 (3.8)	1 (3.8)	N/A
Safe Sex Charities	Approve	1 (3.8)	4 (15.4)	4 (15.4)	4 (15.4)	4 (15.4)
Culture	Disapprove	3 (11.5)	2 (7.7)	4 (15.4)	4 (15.4)	3 (11.5)
Water Companies	Disapprove	N/A	N/A	N/A	N/A	2 (7.7)

Note: N/A signifies that this theme was not present for the condom-related behaviour

Older women reported that in terms of *family* approval, it would be their *daughter* who would approve of these condom-related behaviours being performed, particularly if the woman's relationship status were to change as participant 15 stated, "I think my daughters would if I were a widow embarking on new relationships they would probably remind me." Older males also referred to the *family* as influencing these five condom-related behaviours. All age groups referred to the influence of *parents* in the performance of these five condom-related behaviours. For younger participants, *parents* are likely to be an influential referent, and older responders may well themselves be *parents*, and view themselves as an influential referent.

Other referents that were less frequently elicited were *safer sex charities*, *condom companies* and *culture* (Table 2.4, page 80). Approval by *safer sex charities* for performing *accessing*, *carrying*, *negotiating* and *using* behaviour was only elicited by the gay males in the sample. This may suggest that gay males have been targeted by safer sex messages to a greater extent than other populations, and as a consequence, this belief may be more salient in this sub-population compared with other sub-populations. Only one participant elicited the belief that *condom companies* were a referent that would approve of individuals *accessing* and *using* condoms.

The influence of an individual's *culture* and/or *religion* was a theme for attitudes toward these five condom-related behaviours, however, *cultural* and *religious* influences were also elicited as referents who would disapprove of performing these condom-related behaviours (Table 2.4, page 80). Gay males noted that the *Catholic Church* would disapprove of these five condom-related behaviours. Therefore holding religious beliefs may be difficult for certain individuals where conflicts in beliefs may occur, for example, wishing to comply with one's religion and believing that condom-related behaviours are important behaviours to perform for one's own health and that of your sexual partner.

Although one's sexual *partner*, *parents* and *family* were elicited as referents that would approve of condom-related behaviours being performed, they were also elicited as individuals who would disapprove of performance of these five condom-related behaviours (Table 2.4, page 80). There appears to be an overlap between the *partner* being both an attitudinal and normative influence on behaviour, and a normative conflict from wishing to protect one's *partner* by performing condom-related behaviours, but at the same time a belief that a partner may not wish to *use* condoms. For example, as participant 12 reported, "partner sometimes does not like them." Similarly, *families* may approve of condom-related behaviours for reasons of protecting oneself against unwanted pregnancy and STIs, but they may also be disapproving of these behaviours if

they conflict with *religious* or *cultural* beliefs as participant 10 reported, “in our religion we don’t believe in sex before marriage.”

Some participants elicited the belief that *owners of properties* and *water companies* may also disapprove of the *disposal* of condoms particularly if they were to be disposed of by “flushing down the toilet” as participant 26 reported. The potential impact of this disposal behaviour on the environment was also elicited, participant 17 acknowledged, “the fact that (condoms) may pass through the sewage system to be recycled on our beaches.”

Summary of elicited normative beliefs

Overall there appears to be more referents elicited who would approve of individuals performing these five condom-related behaviours than would disapprove. However, there is some overlap in that some referents who may approve are also ones who may disapprove of these condom-related behaviours being performed highlighting the complexity of performing these behaviours. In a similar capacity to the attitudinal beliefs elicited, individuals who would approve of these condom-related behaviours appear salient across multiple behaviours, whereas disapproving individuals were generated in relation to only one or two condom-related behaviours. Furthermore, across all referents some participants elicited multiple normative beliefs regarding the condom-related behaviour under consideration, whereas other participants elicited no normative referents toward the condom-related behaviour.

Perceived Behavioural Control

The beliefs that participants reported as factors that could enable the performance of these five condom-related behaviours were often elicited as the same factors that would inhibit performance of these behaviours. Similar to attitudinal and normative beliefs, this reveals the complex nature of condom-related cognition and behaviour. Some themes appeared to be unique to a particular behaviour and type of elicitation question asked. The emergent themes are reported (e.g. Situational, then ‘situational’ under discussion of

theme) in relation to the beliefs elicited and the question wording that elicited these beliefs. The actual beliefs individuals elicited and the condom-related behaviour these beliefs relate to are denoted by italics (e.g., *proximity*). The number and percentage of participants who elicited each control theme are shown in Table 2.5.

Table 2.5: Number of participants who gave responses in each category for the enabling and inhibiting questions by condom behaviour

Theme	Question	Accessing n (%)	Carrying n (%)	Negotiating n (%)	Using n (%)	Disposing n (%)
Situational	Enable	7 (26.9)	3 (11.5)	13 (50.0)	4 (15.3)	N/A
	Inhibit	14 (53.8)	1 (3.8)	7 (26.9)	2 (7.7)	N/A
Physical	Enable	1 (3.8)	1 (3.8)	1 (3.8)	1 (3.8)	N/A
	Inhibit	N/A	2 (7.7)	1 (3.8)	N/A	N/A
Self perceptions	Enable	3 (11.5)	5 (19.2)	1 (3.8)	1 (3.8)	N/A
	Inhibit	N/A	3 (11.5)	N/A	N/A	N/A
Partner	Enable	N/A	3 (11.5)	2 (7.7)	11 (42.3)	5 (19.2)
	Inhibit	2 (7.7)	1 (3.8)	5 (19.2)	3 (11.5)	N/A
Environment	Enable	N/A	N/A	N/A	N/A	6 (23.1)
	Inhibit	N/A	N/A	N/A	N/A	7 (26.9)
Relationship status	Enable	1 (3.8)	1 (3.8)	6 (23.1)	N/A	N/A
Culture	Inhibit	1 (3.8)	1 (3.8)	1 (3.8)	N/A	1 (3.8)

Note: N/A signifies that this theme was not present for the condom-related behaviour

Situational

Participants elicited beliefs corresponding to 'situational' factors which would enable and inhibit them from *accessing*, *carrying*, *negotiating* and *using* condoms (Table 2.5). Beliefs elicited in terms of factors that would enable individuals to *access* condoms included if they were in the *proximity* of a

condom vending machine, which may be located in a pub, or close proximity to other outlets which sell condoms such as a chemist. *Proximity* was also elicited as an enabling belief for *carrying* behaviour. For *carrying* behaviour; two other enabling beliefs were elicited; *alcohol* and *location*, as participant 9 reported, “nights out, festivals....place where you could meet someone.” This suggests that individuals may perceive themselves enabled to *carry* condoms when there may be a potential need for them. Furthermore, if an individual knows they are going to be drinking alcohol they may perceive a greater need to *carry* condoms in order to be prepared for sexual intercourse if the opportunity arises. Alcohol was also a belief elicited as a factor which may enable *negotiating* and *using* behaviours. Individuals may perceive that alcohol may give them the courage to bring up the topic of safer sex, and then actually *use* condoms.

Beliefs under the theme ‘situational’ were also elicited as factors that may inhibit performance of *accessing*, *carrying*, *negotiating* and *using* behaviours. Individuals reported that the *time of day* they wished to *access* condoms could be a factor that would inhibit this behaviour, as participant 24 reported, “very late at night.” The physical *location* that individuals were in when they wished to *access* condoms was also reported as a potentially inhibiting factor, such as being at a *festival* and meeting a new sexual partner. Similarly, being in a *queue* visibly holding condoms may inhibit *accessing*, likewise having to deal with as participant 26 reports, “young female staff.” Being in a *long-term relationship*, *not having* condoms and *not carrying a wallet or purse* were reported as factors that would inhibit *carrying* condoms. For *negotiating* behaviour, *timing of negotiation* condom use was reported as a factor that might inhibit this behaviour, particularly when this is with a new sexual partner. Although reported as an enabling factor, *alcohol* was also cited as a factor that may inhibit *negotiating* and *using* behaviours. These beliefs elicited show that many factors may enable or inhibit performance of *accessing*, *carrying*, *negotiating* and *using* behaviours.

Self Perceptions

Participants elicited beliefs corresponding to ‘self perceptions’ which would enable them to *access*, *carry*, *negotiate* and *use* condoms (Table 2.5, page 83). *Carrying* behaviour was the only behaviour where certain ‘self perceptions’ such as *views of others* would inhibit this behaviour as participant 23 reports, “should I be perceived as presumptuous or only interested in one thing.” Individuals generally believed that if they *intend* to they would be able to perform these condom-related behaviours. Control over performing the condom-related behaviours was linked partly with previous *experience*, particularly *negotiating* as participant 9 reported “..this is just a skill that comes with time and experience, really. Even covering this at school won’t do much to help that.”

Partner

Similar to attitudes and SN, participants elicited that the ‘partner’ was someone who may both enable and inhibit them from *accessing*, *carrying*, *negotiating* and *using* condoms (Table 2.5, page 83). Individuals reported that *having* a sexual ‘partner’ may enable them to *carry* condoms. Although elicited as an affective attitude, *trust* in one’s ‘partner’ was also reported as a factor that would enable condom *negotiation*. Furthermore, having as participant 11 reported “open communication” would also enable *negotiation* of condom use.

Culture

Similar to attitudes and SN, ‘culture’ was elicited as a factor that could inhibit *accessing*, *carrying*, *negotiating* and *using* condoms (Table 2.5, page 83). Individuals were not specific about how ‘culture’ may inhibit them from performing these condom-related behaviours. Rather in relation to factors that would inhibit the condom-related behaviours individuals for example, participant 22 reported, “some culture/countries.” However, it may be speculated that strong cultural (and religious) beliefs concerning condoms may cause conflict in individuals, which in turn inhibits behaviour (e.g., Mishtal and Dannefer 2010). Culture was not viewed as a factor that may enable control of any of the five condom-related behaviours under investigation.

Environment

Participants elicited beliefs concerning the ‘environment’ only in relation to factors that would enable or inhibit condom *disposal* (Table 2.5, page 83). Beliefs such as the *availability of a bin* for condom *disposal*, and *disposing* of a used condom at *home* were elicited as both an enabling and inhibiting factor. Participant 6, in relation to *disposal* reported, “in a public place, not in your own home.” *Disposal* may be difficult when a condom is used in, for example, a hotel, as cleaning staff may see the *used* condom which could cause embarrassment if staying for subsequent nights. Thus feelings and perceptions of control may be closely linked as reasons why condoms may not be *used*.

Physical

Participants elicited beliefs concerning ‘physical’ factors in relation only to factors that would inhibit *carrying* and *negotiating* behaviours (Table 2.5, page 83). Although elicited as an affective attitude, *packaging* of condoms was also cited as a reason for inhibiting *carrying* behaviour. Having a medical condition such as *latex intolerance* was reported by participant 26 as a factor that would inhibit *negotiating* condom use, but did not elicit that this would inhibit condom *use*.

Relationship status

Participants reported that ‘relationship status’ was an enabling factor for *accessing*, *carrying* and *negotiating* behaviours (Table 2.5, page 83). A change in ‘relationship status’ such as becoming *widowed* was elicited as an enabling factor to perform these five condom-related behaviours.

Summary of elicited control beliefs

There appears to be a range of factors that participants believed may enable or inhibit performance of these five condom-related behaviours. Some issues such as a bin to dispose of a used condom were reported as both inhibiting and enabling factors for only one condom-related behaviour, *disposal*. Other factors, such as one’s sexual partner was reported as potentially influencing perceived

control both positively and negatively for a number of condom-related behaviours. Similar to the attitudinal and SN beliefs elicited, some participants elicited multiple control beliefs regarding the condom-related behaviour under consideration, whilst others elicited no control beliefs toward the condom-related behaviour.

Summary of all TPB belief elicitation analysis

Three themes ‘self perceptions’, ‘partner’ and ‘culture’ emerge under the attitudinal, normative and control beliefs categories, which suggests there is conceptual overlap between the TPB constructs. The content analysis further suggests that individuals may hold multiple competing beliefs, both positive and negative, toward condom-related behaviours. An individual may for example, have the self perception that they are *in control* and *independent* by *carrying* condoms, yet also hold a self perception that they are viewed by others as being *presumptuous* or *easy* as they *carry* condoms. A large range of attitudinal, normative and control beliefs toward all five condom-related behaviours were elicited. However, not all participants elicited attitudinal, normative or control beliefs for each condom-related behaviour. This may be because the participant did not have experience in performing the condom-related behaviour so held no belief(s), or they had experience but did not have any belief(s), or it may simply reflect non-response to the question.

2.3.2 Proportional analysis on behavioural beliefs elicited by different questions

In order to address the first hypothesis, where it was expected that some behavioural beliefs toward the five condom-related behaviours were more likely to be elicited as either an affective or cognitive belief, the proportional test by Newcombe and Altman (2000) for paired samples was conducted on the attitudinal themes. As in previous research (French et al. 2005; Sutton et al. 2003), this test was run separately for the number of participants who reported different categories of beliefs according to whether they were in response to an advantage or like question, or to a disadvantage or dislike question, in relation

to performing the five condom-related behaviours. The numbers of beliefs participants generated for each theme are shown in Tables 2.2 and 2.3 (pages 72 and 73).

Proportional analysis on the themes generated by questions about the advantages and likes of performing five condom-related behaviours suggested that individuals were more likely to elicit cognitive advantage responses that performing *accessing*, *carrying*, *negotiating* and *using* behaviours would help to 'prevent unwanted pregnancy and STIs' ($p < .05$). Other themes such as 'safe', 'partner reactions', 'practical issues', 'IOSA', 'physical impact' and 'self perceptions' from performing these five condom-related behaviours were just as likely to be elicited as both an affective and cognitive belief ($p > .05$). A large number of participants did not elicit any positive affective or cognitive beliefs for these five condom-related behaviours, suggesting for these participants performing these condom-related behaviours may not be strongly associated with either type of positive belief.

Proportional analysis on the themes generated by questions about the disadvantages and dislikes of performing five condom-related behaviours suggested that individuals were more likely to elicit affective dislike responses in relation to the 'self perceptions' theme of *accessing* condoms ($p < .05$). Similarly, for *accessing*, *carrying* and *disposing* behaviours the 'embarrassment' theme was more likely to be elicited as affective dislike responses ($p < .05$). For *carrying* behaviour, the 'practical issues' theme was more likely to be elicited as a cognitive belief ($p < .05$). For *accessing*, *using* and *disposing* behaviours, the 'IOSA' theme was more likely to be elicited as a cognitive belief ($p < .05$). Similar to the advantages/likes questions, a large number of participants did not elicit any negative affective or cognitive beliefs toward these five condom-related behaviours, suggesting for these participants, performing these behaviours may not be strongly associated with either belief type. Overall it appears that some behavioural beliefs are more likely to be elicited as either an

affective or cognitive belief depending on the condom-related behaviour being considered.

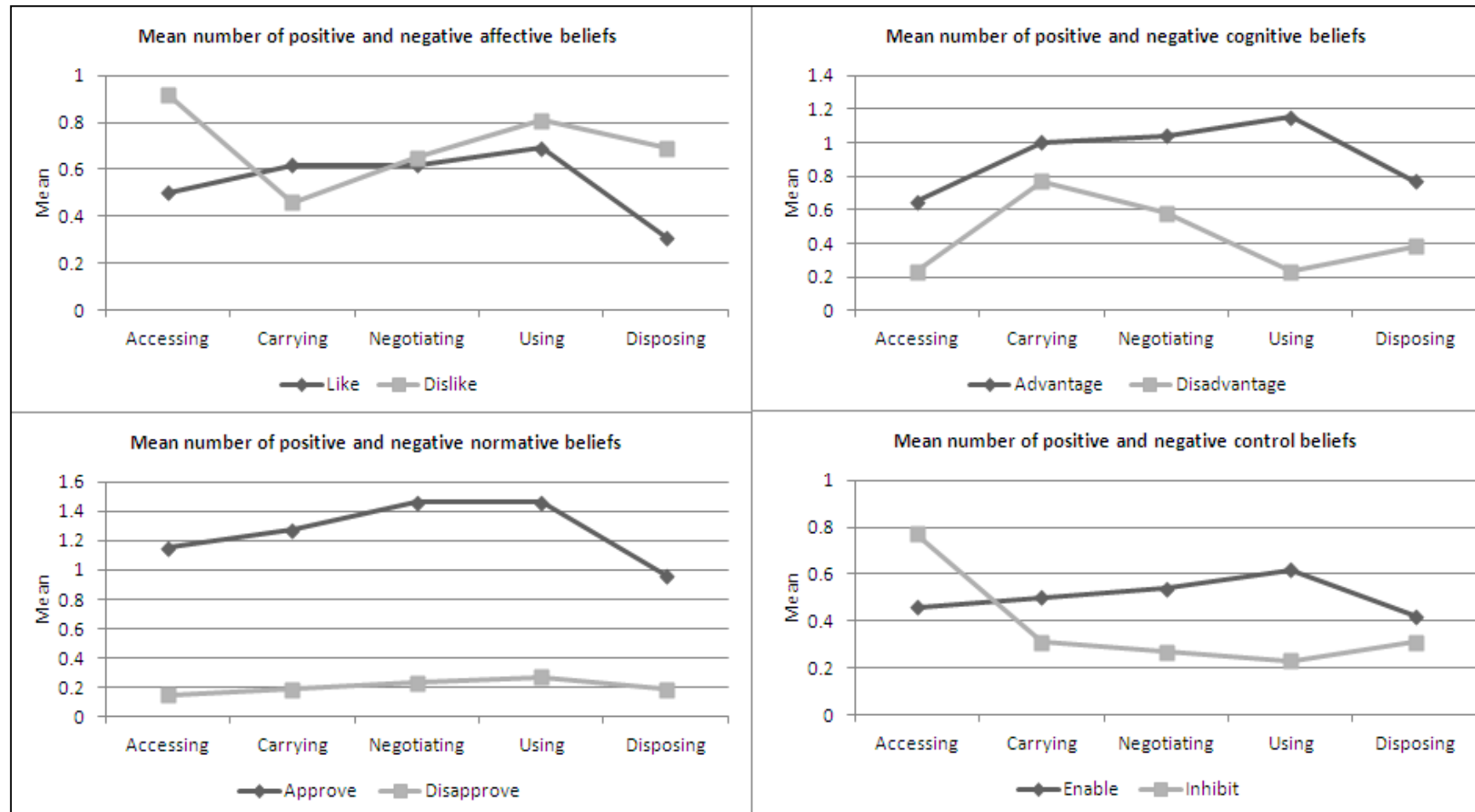
2.3.3 MANOVA analysis to determine if there are different numbers of positive and negative beliefs elicited for the five condom-related behaviours

In order to test the second hypothesis, where it was expected that individuals were likely to elicit different numbers of positive and negative affective, cognitive, normative and control beliefs depending on the condom-related behaviour being considered, a 2 (belief valence: positive versus negative) x 5 (condom-related behaviour: ACNUD) repeated measures MANOVA was performed. Figure 2.5 (page 90) suggests that for all five condom-related behaviours, more positive cognitive and normative beliefs were elicited than negative beliefs. Yet, for affective and control beliefs, some condom-related behaviours appear to generate more positive beliefs, and other condom-related behaviours generate more negative beliefs.

Using Wilks' Lambda (Λ) statistic, findings from the MANOVA suggest that there was a main effect of valence ($\Lambda = .36$, $F(4, 22) = 9.88$, $p = .001$, $\eta^2 = 0.64$), a close to significant main effect of behaviour ($\Lambda = .19$, $F(16, 10) = 2.69$, $p = .06$, $\eta^2 = 0.81$), and a close to significant interaction of valence by behaviour ($\Lambda = .18$, $F(16, 10) = 2.81$, $p = .06$, $\eta^2 = 0.82$).

Univariate follow-up tests showed a main effect of valence for cognitive ($F(1, 25) = 32.80$, $p = .001$, $\eta^2 = 0.57$), and normative beliefs ($F(1, 25) = 11.9$, $p = .002$, $\eta^2 = 0.32$). Pairwise comparisons, with Bonferroni adjustment for multiple comparisons, suggested more positive than negative beliefs were generated for cognitive (95% CI for difference = .31 to .66, $p = .001$) and normative (95% CI for difference = .42 to 1.68, $p = .002$) TPB constructs.

Figure 2.5: Mean number of positive and negative affective, cognitive, normative and control beliefs generated for each condom-related behaviour



For behaviour, which approached significance, univariate follow-up tests showed there was a significant main effect for mean number of cognitive beliefs generated, $F(4, 100) = 6.16, p = .001, \eta^2 = 0.20$. Pairwise comparisons, with Bonferroni adjustment for multiple comparisons, suggested more cognitive beliefs were generated for *carrying* than *accessing* behaviour (95% CI for difference = .12 to .7, $p = .003$), and for *negotiating* than *accessing* behaviour (95% CI for difference = .09 to .64, $p = .004$).

For the valence by behaviour interaction, which approached significance, univariate follow-up tests showed there was a significant interaction for cognitive ($F(4, 100) = 2.66, p = .05, \eta^2 = 0.10$), and control beliefs ($F(4, 100) = 3.08, p = .03, \eta^2 = 0.11$). To further explore these valences by behaviour interactions, a series of paired t -tests were run. To correct for the number of comparisons being run, Bonferroni correction placing $p = .003$ was applied to the results. Using this correction, results suggested that on average, for *using* behaviour, participants elicited a significantly greater number of advantage ($M = 1.15, SD = .68$) than disadvantage beliefs ($M = .23, SD = .43, t(25) = 7.50, p = .001$). Similarly, using the Bonferroni correction, results suggested that on average for *accessing* ($M = 1.15, SD = 1.52$), *carrying* ($M = 1.27, SD = 1.69$), *negotiation* ($M = 1.46, SD = 1.75$), *using* ($M = 1.46, SD = 1.68$) behaviours, participants produced significantly more positive beliefs than negative beliefs for *accessing* ($M = .15, SD = .37, t(25) = 3.41, p = .002$), *carrying* ($M = .19, SD = .40, t(25) = 3.29, p = .003$), *negotiating* ($M = .23, SD = .43, t(25) = 3.59, p = .001$), *using* ($M = .27, SD = .45, t(25) = 3.44, p = .002$), regarding referents who would approve of them performing these condom-related behaviours. Applying Bonferroni correction, no differences were found between the numbers of positive and negative affective or control beliefs elicited by condom-related behaviour.

These findings suggest that individuals elicit more advantage beliefs than disadvantage beliefs toward *using* condoms, and more referents who would approve of them *accessing*, *carrying*, *negotiating* and *using* condoms than

referents who would disapprove of these behaviours. Overall, findings indicate that individuals elicit different numbers of positive and negative cognitive and normative beliefs towards *accessing*, *carrying*, *negotiating* and *using* condom-related behaviours. But similar numbers of positive and negative affective and control beliefs are elicited for all five condom-related behaviours.

2.3.4 MANOVA analysis to determine if different populations elicit different numbers of beliefs depending on the question asked

In order to test the second hypothesis, where it was expected that different populations were likely to elicit different numbers of affective, cognitive, normative and control beliefs toward different condom-related behaviours, the sample was further sub-divided into younger men (YM ≤ 39) ($n = 8$), older men (OM ≥ 40) ($n = 5$), younger women (YF ≤ 39) ($n = 5$), and older women (OF ≥ 40) ($n = 8$), using splits employed in previous elicitation research (Darker et al. 2007). Table 2.6 (pages 93) shows the mean number of beliefs elicited and standard deviations for each of these populations by condom-related behaviour and elicitation question. These means, although small, suggest there may be a difference in the number of beliefs produced by different populations.

To determine whether different populations elicit differing numbers of beliefs toward the five condom-related behaviours depending on the question asked, a 4 (population: YM, OM, YF, OF) \times 8 (elicitation question: like, dislike, advantage, disadvantage, approve, disapprove, enable, inhibit) repeated measures MANOVA was performed. Using Wilks' Lambda statistic (Λ), results suggest there was no main effect of population ($\Lambda = .00$, $F(60, 9.79) = .87$, $p = .66$, $\eta^2 = 0.84$), no main effect of elicitation question ($\Lambda = .12$, $F(20, 3) = 1.15$, $p = .53$, $\eta^2 = 0.89$), and no interaction between elicitation question and population ($\Lambda = .00$, $F(60, 9.79) = 1.29$, $p = .35$, $\eta^2 = 0.89$), for any of the five condom-related behaviours.

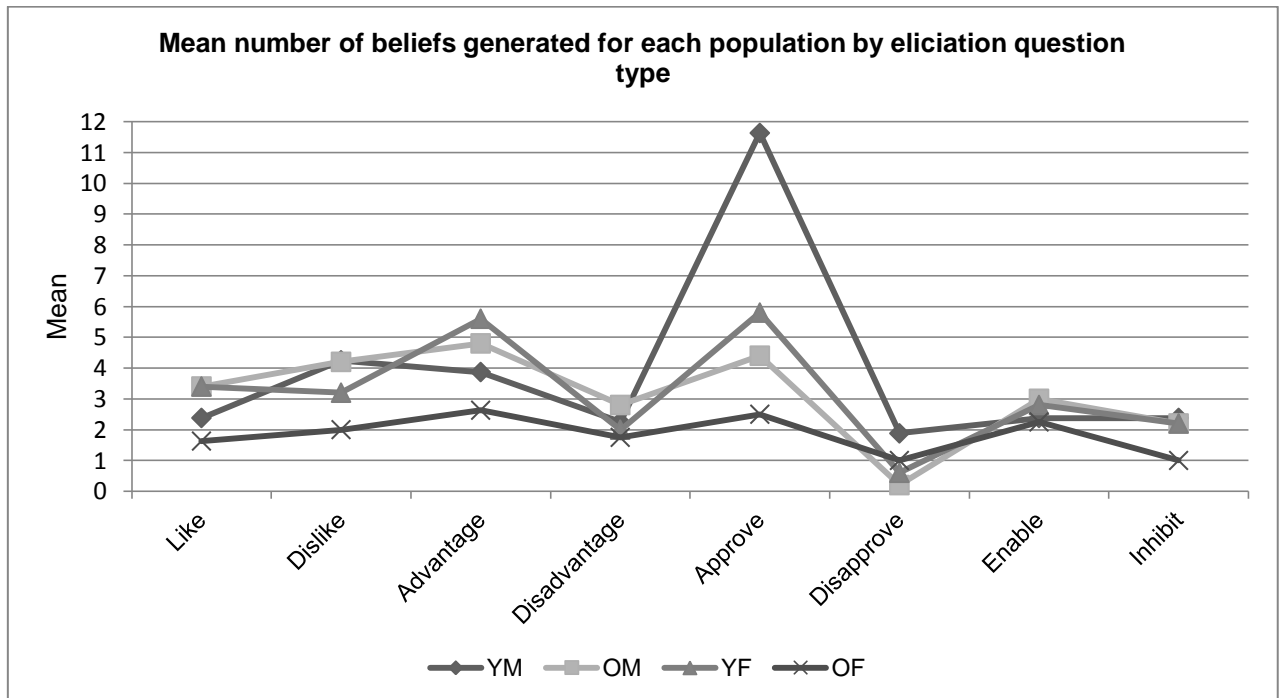
Table 2.6: Means \pm standard deviations of number of beliefs elicited by condom-related behaviour, elicitation question and population

Behaviour	Question	Younger males	Older males	Younger females	Older females
Accessing	Like	0.38 \pm 0.52	0.60 \pm 0.55	0.80 \pm 0.45	0.38 \pm 0.52
	Dislike	1.13 \pm 0.84	1.00 \pm 0.71	0.80 \pm 0.84	0.75 \pm 0.46
	Advantage	0.63 \pm 0.74	1.00 \pm 0.71	1.00 \pm 0.71	0.25 \pm 0.46
	Disadvantage	0.25 \pm 0.46	0.40 \pm 0.55	0.00 \pm 0.00	0.25 \pm 0.46
	Approve	1.88 \pm 2.03	0.80 \pm 0.84	1.00 \pm 1.23	0.75 \pm 1.39
	Disapprove	0.38 \pm 0.52	0.00 \pm 0.00	0.00 \pm 0.00	0.13 \pm 0.35
	Enable	0.38 \pm 0.52	0.60 \pm 0.55	0.40 \pm 0.55	0.50 \pm 0.54
	Inhibit	0.88 \pm 0.35	0.80 \pm 0.45	1.40 \pm 1.68	0.25 \pm 0.46
Carrying	Like	0.63 \pm 0.52	0.80 \pm 0.84	0.80 \pm 0.84	0.38 \pm 0.52
	Dislike	0.38 \pm 0.52	0.80 \pm 0.45	0.40 \pm 0.55	0.38 \pm 0.52
	Advantage	1.00 \pm 0.54	1.00 \pm 0.00	1.40 \pm 0.89	0.75 \pm 0.71
	Disadvantage	0.75 \pm 1.04	1.00 \pm 1.00	1.00 \pm 1.00	0.50 \pm 0.54
	Approve	2.38 \pm 2.33	0.80 \pm 0.84	1.20 \pm 1.30	0.50 \pm 1.07
	Disapprove	0.25 \pm 0.46	0.00 \pm 0.00	0.40 \pm 0.55	0.13 \pm 0.35
	Enable	0.38 \pm 0.52	0.80 \pm 0.84	0.80 \pm 0.84	0.25 \pm 0.46
	Inhibit	0.38 \pm 0.52	0.40 \pm 0.55	0.20 \pm 0.45	0.25 \pm 0.46
Negotiating	Like	0.63 \pm 0.74	0.40 \pm 0.55	1.00 \pm 0.71	0.50 \pm 0.54
	Dislike	0.88 \pm 0.84	1.20 \pm 0.84	0.40 \pm 0.89	0.25 \pm 0.46
	Advantage	1.00 \pm 0.54	1.00 \pm 0.71	1.40 \pm 0.89	0.88 \pm 0.84
	Disadvantage	0.63 \pm 0.74	0.80 \pm 0.84	0.40 \pm 0.55	0.50 \pm 0.54
	Approve	2.63 \pm 2.13	1.20 \pm 1.79	1.20 \pm 1.30	0.63 \pm 1.06
	Disapprove	0.38 \pm 0.52	0.20 \pm 0.45	0.20 \pm 0.45	0.13 \pm 0.35
	Enable	0.25 \pm 0.46	0.60 \pm 0.55	0.80 \pm 0.84	0.63 \pm 0.52
	Inhibit	0.38 \pm 0.52	0.40 \pm 0.55	0.20 \pm 0.45	0.13 \pm 0.35
Using	Like	0.75 \pm 0.46	1.00 \pm 0.71	0.80 \pm 0.84	0.38 \pm 0.52
	Dislike	1.13 \pm 0.64	0.80 \pm 0.45	0.20 \pm 0.25	0.13 \pm 0.35
	Advantage	1.13 \pm 0.64	1.40 \pm 0.55	1.00 \pm 1.00	1.13 \pm 0.64
	Disadvantage	0.38 \pm 0.52	0.00 \pm 0.00	0.40 \pm 0.55	0.13 \pm 0.35
	Approve	2.63 \pm 2.13	1.00 \pm 1.00	1.60 \pm 1.34	0.50 \pm 1.07
	Disapprove	0.63 \pm 0.52	0.00 \pm 0.00	0.00 \pm 0.00	0.25 \pm 0.46
	Enable	1.00 \pm 1.07	0.60 \pm 0.55	0.40 \pm 0.55	0.38 \pm 0.52
	Inhibit	0.25 \pm 0.46	0.40 \pm 0.55	0.40 \pm 0.55	0.00 \pm 0.00
Disposing	Like	0.25 \pm 0.46	0.80 \pm 0.45	0.20 \pm 0.45	0.13 \pm 0.45
	Dislike	1.00 \pm 0.93	0.80 \pm 0.45	0.80 \pm 0.84	0.25 \pm 0.46
	Advantage	0.75 \pm 0.71	1.20 \pm 0.45	1.00 \pm 0.71	0.38 \pm 0.52
	Disadvantage	0.38 \pm 0.52	0.60 \pm 0.55	0.20 \pm 0.45	0.38 \pm 0.52
	Approve	2.13 \pm 1.96	0.60 \pm 0.89	0.80 \pm 1.30	0.13 \pm 0.35
	Disapprove	0.25 \pm 0.46	0.00 \pm 0.00	0.00 \pm 0.00	0.38 \pm 0.52
	Enable	0.38 \pm 0.52	0.40 \pm 0.55	0.40 \pm 0.55	0.50 \pm 0.54
	Inhibit	0.50 \pm 0.54	0.20 \pm 0.45	0.00 \pm 0.00	0.38 \pm 1.06

Note: Some individuals elicited no beliefs and two YM elicited six approve normative beliefs

As the mean number of beliefs elicited by population, question type and condom-related behaviour shown in Table 2.6 (page 93) were small; the data was further collapsed so that a second MANOVA analysis could be undertaken on the number of beliefs elicited by question type but not by condom-related behaviour. Figure 2.6 shows these collapsed means. A 4 (population: YM, OM, YF, OF) x 8 (elicitation question: like, dislike, advantage, disadvantage, approve, disapprove, enable, inhibit) repeated measures MANOVA, using Wilks' Lambda statistic (Λ), further suggested there was no main effect of population ($\Lambda = .42$, $F(12, 50.56) = 1.64$, $p = .11$, $\eta^2 = 0.25$), and no interaction between elicitation question and population ($\Lambda = .61$, $F(12, 50.56) = .88$, $p = .57$, $\eta^2 = 0.15$). However, there was a main effect of elicitation question ($\Lambda = .41$, $F(4, 19) = 6.93$, $p = .001$, $\eta^2 = 0.59$).

Figure 2.6: Mean number of beliefs elicited by population and elicitation question



Note: YM = younger men aged ≤ 39, OM = older men aged ≥ 40, YF = younger women aged ≤ 39, and OF = older women aged ≥ 40

Univariate follow-up tests exploring the main effect of question type confirmed the results described in section 2.3.3 (page 89), that there was a main effect of question type for cognitive ($F(1, 22) = 21.36, p = .001, \eta^2 = 0.49$), and normative beliefs ($F(1, 22) = 11.78, p = .002, \eta^2 = 0.35$). Pairwise comparisons, with Bonferroni adjustment for multiple comparisons, suggested more positive than negative beliefs were generated for cognitive (95% CI for difference = 1.12 to 2.93, $p = .001$) and normative (95% CI for difference = 2.04 to 8.28, $p = .002$) TPB constructs for all populations.

2.4 Discussion

The present elicitation study reported the beliefs, individuals in a broad population sample held toward performing five condom-related behaviours within an extended TPB framework, which separates attitudinal beliefs into affective and cognitive. The primary aim of this study was to elicit beliefs that could be used in a questionnaire study, which is the second phase of intervention development using the TPB (Ajzen 2006a; Francis et al. 2004; Sutton 2002). The beliefs that individuals elicited were subjected to three further sets of analyses in order to address three hypotheses, contributing to the existing literature relating to the application of the TPB to condom-related behaviours.

In terms of identifying beliefs to include in a questionnaire study, a range of beliefs were elicited. These beliefs were content analysed into themes, this analysis served two functions; first, it allowed the large number of beliefs generated by participants to be grouped into smaller categories. Second, it enabled subsequent proportional analysis on the attitudinal data of the themes. In terms of themes, seven attitudinal, eight normative, and seven control themes were generated. Some themes reoccurred across all TPB constructs, such as the 'partner', whereas others were specific to a TPB construct, such as 'environment' factors that may both enable and inhibit performance of condom-related behaviours. The number of beliefs that were generated for each theme varied. For example, *embarrassment* was a commonly-cited belief across all

five condom-related behaviours. According to rules of determining modally salient beliefs to be included in a TPB questionnaire (e.g., Sutton et al. 2003), this belief was modal as it was elicited by more than 10% of individuals'. Therefore it seemed appropriate that 'embarrassment' became an attitudinal theme, even though it consisted of only one belief. Beliefs such as *time of day*, *visibility* (of condoms), *cost* and *queue*, were all elicited by one or two individuals', but together these beliefs are all important 'situational' factors that may enable and/or inhibit performance of condom-related behaviours. Therefore, beliefs elicited by one or two individuals, were grouped into larger themes in order for further analysis to be undertaken on the data. The beliefs to be included in the questionnaire study as a result of this analysis, which will be reported in chapter 3 of this thesis, will be discussed in section 2.4.1 (page 98).

The first hypothesis tested, predicted that some behavioural beliefs were more likely to be elicited as affective or cognitive beliefs. Breckler (1984) argues that cognitive attitudes are viewed as knowledge based, and affective attitudes emotionally based. The analysis undertaken on the themes supported this distinction, as knowledge that condom-related behaviours will *prevent unwanted pregnancy* and *STIs* was only elicited as a cognitive belief in response to the advantage elicitation question. Similarly, feeling *embarrassed* by performing *accessing*, *carrying* and *disposing* behaviours was only elicited as an affective belief in response to the dislike elicitation question. Despite some behavioural beliefs being more likely to be elicited as either an affective or cognitive belief; many behavioural beliefs were as likely to be elicited as both an affective and cognitive belief. Exploration of these findings in relation to the existing literature will be discussed further in section 2.4.2 (page 101).

The second hypothesis tested, predicted that individuals were likely to elicit different numbers of positive and negative beliefs towards the five condom-related behaviours. Results suggested that for all five condom-related behaviours, individuals elicited more positive cognitive and normative beliefs. Furthermore, results suggested that the main effect of behaviour was close to

significance which justified further exploration. This exploration suggested that individuals elicited more cognitive beliefs towards these five condom-related behaviours than other TPB beliefs. Additionally, *carrying* and *negotiating* behaviours appeared to generate more cognitive beliefs than *accessing* behaviour. Finally, the interaction between belief valence and behaviour was close to significance which justified further exploration. Findings suggested that there was an interaction between behaviour and cognitive and control beliefs. Further exploration of these findings suggested for *using* behaviour, individuals elicited significantly more advantage than disadvantage beliefs, and more positive than negative normative beliefs were elicited for *accessing*, *carrying*, *negotiating* and *using* behaviours. No significant difference in the number of control beliefs elicited was found. Exploration of these findings in relation to the existing literature will be discussed further in section 2.4.3 (page 103).

The third hypothesis tested, predicted that different populations would elicit differing numbers of TPB beliefs toward different condom-related behaviours. The sample was grouped into four populations for this analysis (section 2.3.4, page 92). Results suggested that for all five condom-related behaviours, there were no differences in the number of beliefs elicited between the populations, no differences in the number of beliefs elicited by question type, and no interaction effect between elicitation question and population. As the mean number of beliefs elicited by question type for each condom-related behaviour was small in each of the four populations, a second analysis was performed, exploring the number of beliefs elicited by question type for all five condom-related behaviours in the four populations. Results suggested there were no differences between the four populations in the number of beliefs elicited by question type, but across all four populations more positive cognitive and normative beliefs were elicited. Exploration of these findings in relation to the existing literature will be discussed further in section 2.4.4 (page 105).

This study has contributed to the literature concerning online TPB elicitation studies. Typically, TPB elicitation studies explore beliefs toward one behaviour

(e.g., Darker et al. 2007). This study demonstrated that individuals' are able to elicit beliefs toward performing multiple behaviours in one survey. Furthermore, taking an online approach to conducting the elicitation study reduced time and monetary costs associated with traditional interview elicitation techniques, as discussed in chapter 1 (section 1.5.2, page 47). Although the data gathered may not be as detailed using online elicitation compared to face-to-face interviews (Grbich 1999; Murray 2004), and using online elicitation the researcher cannot be sure whether an individual truly does not hold any beliefs or chose not to respond to the question. Future elicitation studies should consider using online methods given the number of internet users is increasing annually (ONS 2011a). Similarly, as TPB-based interventions are based on changing beliefs (Ajzen 2006a), less rich data is not an issue compared to qualitative studies that require individuals to share experiences (Hale, Grogan and Willott 2010). In this online elicitation study, a range of beliefs were gathered from a broad population.

2.4.1 Beliefs identified for inclusion in a TPB questionnaire exploring five condom-related behaviours

Findings suggested that some beliefs were elicited by individuals for more than one TPB construct, suggesting the argument of Miniard and Cohen (1981) (section 1.3.2, page 22) is correct. Some beliefs may be framed as either behavioural or normative beliefs, and findings from this study suggest this argument may also be extended where these behavioural and normative beliefs could be reframed as control beliefs, as beliefs under the 'partner' theme appeared across all TPB constructs.

In terms of identifying beliefs to include in a subsequent questionnaire study, it appeared that in this elicitation study, the majority of themes were elicited by more than 10% of participants (Tables 2.2 and 2.3, pages 72 and 73). Attitudinal themes salient across all five condom-related behaviours were 'safe', and 'self perceptions', suggesting the beliefs under these themes should be included in a TPB questionnaire for all five condom-related behaviours.

Although the ‘partner’ was an attitudinal theme across all five condom-related behaviours, for *accessing* and *using* behaviours, the theme was salient for less than 10% of the participants, which according to Ajzen and Fishbein (1980) means these beliefs are not modally salient in the population. However, the influence of the sexual partner is widely documented in terms of condom *use* (e.g., Norton et al. 2005; Sheeran and Orbell 1998), particularly when condom *use* is discontinued in a committed relationship (Bolton, McKay and Schneider 2010), and when *negotiating* use does and does not take place with a partner (De Visser and Smith 2001). It seems appropriate that although some individuals may hold behavioural beliefs concerning their sexual partner, that for *accessing* and *using* behaviour influences of the sexual partner are framed as normative and control beliefs only.

This argument is also true for the culture theme, that although elicited in relation to all three TPB constructs, it would be more appropriate for these beliefs to be framed as normative and control items (Fishbein et al. 1993). For *carrying* behaviour, the salient attitudinal theme appeared to be ‘practical issues’, but these ‘practical issues’ and underlying beliefs are also relevant for *accessing* behaviour (Dahl et al. 2006). Arguably therefore, although for *accessing* behaviour this theme was not modally salient in the population, beliefs pertaining to the ‘practical issues’ theme should be included in the pilot questionnaire exploring beliefs towards *accessing* and *carrying* condoms so that in a larger sample, the beliefs most predictive of intention to perform these condom-related behaviours can be identified.

In terms of affective beliefs, De Wit, Victoir and Van den Bergh (1997b) used 10 items from the evaluative dimension of Osgood’s semantic differential (Osgood, Suci and Tannenbaum 1957) to measure affective attitudes toward condom *use*. In the present study, affective beliefs elicited for condom *use* were similar to those chosen by De Wit, Victoir and Van den Bergh (1997b). For example, the authors chose the feeling of romantic, whereas in this sample individuals elicited the opposite feeling *unromantic* in relation to condom *use*. In this study,

feeling *embarrassed* was elicited by more than 10% of participants for *accessing*, *carrying*, *negotiating* and *using* behaviours but was not included in the De Wit, Victoir and Van den Bergh (1997b) scale. Yet feeling *embarrassed* has previously been reported by individuals when performing these condom-related behaviours (Moore et al. 2006; 2008), and arguably should be included in the affective scale for all five condom-related behaviours. For the pilot questionnaire, as few affective beliefs were elicited, it would be appropriate to include all those elicited, and adopt wording previously used by De Wit, Victoir and Van den Bergh (1997b) for example, romantic rather than unromantic so that comparisons can be made on which affective beliefs are most predictive of intention.

Similar to other research, referents such as one's partner may both wish them to perform and not perform these condom-related behaviours (e.g., Agnew 2000; Armitage and Talibudeen 2010). Generally in this study the same referents were elicited for all five condom-related behaviours (Table 2.4, page 80). The referents elicited are similar to those cited in other research (e.g., Agnew 2000; Bayley, Brown and Wallace 2009; Yzer, Siero and Buunk 2001). Arguably therefore, it seems appropriate that all elicited referents are included in the pilot study questionnaire. Data from the pilot study can then be used to determine which referents are most predictive of the SN construct and retained for the 'main' questionnaire study (Hagger, Chatzisarantis and Biddle 2001; Sutton 2002).

Seven control-related themes were elicited in this sample (Figure 2.4, page 69). The 'partner' theme was elicited in relation to all five condom-related behaviours as both an enabling and inhibiting factor, the theme appeared to be modally salient for four behaviours (*carrying*, *negotiating*, *using* and *disposing*). This finding is consistent with the existing literature (e.g., Bennett and Bozionelos 2000), demonstrating that condom-related behaviours, particularly *negotiation* and *use* need the cooperation of one's partner (De Bro, Campbell and Peplau 1994; Yzer, Siero and Buunk 2001). If one's partner is unwilling to perform safer

sex, the individual has little control, and must choose whether to practice unsafe sex (Bennett and Bozionelos 2000; Broadstock and Michie 2000). Similarly, the 'situational' theme contained beliefs which could both enable and inhibit performance of four condom-related behaviours (*accessing*, *carrying*, *negotiating* and *using*). These situational beliefs were elicited by over 10% of participants, and have previously been found to influence condom use (Dahl et al. 2006; Moore et al. 2006; Sheeran, Abraham and Orbell 1999). Arguably, due to the small number of control beliefs elicited, all control beliefs should be included in the pilot questionnaire study and those most predictive of PBC should be retained for the main study. In most TRA/TPB studies around four beliefs appear to be the most predictive of its related construct (Hagger, Chatzisarantis and Biddle 2002). Eliminating beliefs at the elicitation stage may remove the most predictive beliefs when explored in a larger sample.

2.4.2 Behavioural beliefs elicited by affective and cognitive questioning

Theoretically, neither the TRA nor TPB distinguish between affective and cognitive attitudes (Ajzen 1991; Ajzen and Fishbein 1972; French et al. 2005). Yet the literature suggests that affective attitudes are more likely to predict intentions to perform behaviour than cognitive attitudes (e.g., Lawton, Conner and McEachan 2009), and interventions targeting affective beliefs are more effective at changing behaviour than interventions targeting cognitive beliefs (e.g., Ferrer et al. 2011). Therefore, if interventions are to manipulate affective and/or cognitive beliefs, then elicitation research needs to be clear whether individuals distinguish between affective and cognitive behavioural beliefs (French et al. 2005; Norton et al. 2005).

In the present study using proportional analysis to explore whether certain attitudinal beliefs are more likely to be elicited through affective or cognitive questioning, the findings did suggest that some themes are more likely to be either affectively or cognitively elicited. However, other beliefs such as those relating to safety were as likely to be elicited as a positive affective and cognitive belief. This result is perhaps unsurprising given that an individual may

feel *safe* from performing these condom-related behaviours, but also have knowledge that performing these condom-related behaviours is *safer* than *not* performing these behaviours, or vice versa. This dual knowledge and feeling of safety may have been gained from media advertisements promoting condom-related behaviours (e.g., NHS Choices 2010). Beliefs elicited under the attitudinal theme ‘self perceptions’ appeared to be significantly more likely to be elicited as an affective rather than a cognitive belief for *accessing* behaviour in relation to the dislike/disadvantage questions only. For *accessing* and *carrying* behaviours, a greater number of individuals elicited positive affective rather than cognitive beliefs (Table 2.2, page 72). Similarly, for *accessing*, *negotiating*, *using* and *disposing* behaviours, a greater number of individuals elicited negative affective rather than positive cognitive beliefs (Table 2.3, page 73). These results suggest that in order to identify attitudinal targets for safer sex interventions, questionnaire studies such as the one to be reported in chapter 3, should include both affective and cognitive beliefs in order to identify the attitudinal beliefs most predictive of condom-related behaviours.

These findings also suggested that participants had good knowledge about the purpose of performing condom-related behaviours, to protect oneself and partner from unwanted pregnancy and STIs. This knowledge-based attitude concerns the health benefits of performing condom-related behaviours, and was significantly more likely to be elicited as a cognitive belief. This finding is consistent with the exercise literature where elicited cognitive beliefs are more likely to be concerned with health improvements from exercise (French et al. 2005). Yet the use of condoms may be perceived to have a negative impact on the sexual act (e.g., Norton et al. 2005). In the present study, attitudes relating to the negatives impacts on the sexual act were more likely to be elicited in response to cognitive disadvantage elicitation questions. As other research has demonstrated (e.g., Moore et al. 2006), this sample all reported that condom-related behaviours were embarrassing to perform, and this belief was significantly more likely to be elicited in response to the affective dislike elicitation question. Although in this sample the number of affective and

cognitive beliefs elicited was low, these findings support previous research demonstrating that different behavioural beliefs are elicited by different types of questioning (Ajzen and Driver 1991; French et al. 2005; Sutton et al. 2003). This finding supports the first research hypothesis (section 2.1.4, page 59), as beliefs such as embarrassment, were only elicited in response to the affective elicitation questions.

The different attitudinal beliefs elicited from different questioning highlights the importance of exploring both affective and cognitive beliefs toward performing these five condom-related behaviours as the first stage of intervention development. For example, *negotiating* and *using* behaviours cannot be achieved without interaction with another individual (e.g., Yzer, Siero and Buunk 2001), and *accessing* condoms may require face-to-face contact if obtained in a retail outlet (Dahl et al. 2006; Fisher, Fisher and Byrne 1977). These condom-related behaviours are likely to produce both positive and negative feelings for individuals, as demonstrated in this elicitation study. However, individuals are also aware of the benefits of performing these condom-related behaviours, demonstrated through responses to the cognitive elicitation questions. This study extends the study of De Wit, Victoir and Van den Bergh (1997b) which only differentiated affective and cognitive attitudes toward condom use. Distinguishing between affective and cognitive beliefs toward the full range of condom-related behaviours is necessary for intervention development, because as it was argued in section 2.1.1 (page 53), for individuals to practice safer sex a number of condom-related behaviours may be required. Identifying the behavioural beliefs most predictive of intention toward each condom-related behaviour is important for developing an intervention, maximising the intervention's potential to improve safer sex behaviour (Agnew 2000; Ajzen 2006a; Sutton 2002).

2.4.3 Positive and negative beliefs toward five condom-related behaviours

There is a plethora of literature that argues individuals can hold positive, negative and ambivalent beliefs toward behaviours (e.g., Ajzen 2001; Armitage

2003). Findings from this study support this literature. Exploring belief valence toward these five condom-related behaviours is important, as interventions to change health risk behaviours seek to either strengthen existing positive beliefs (Sutton 2002), or change negative beliefs (Ajzen 2006a). Results in this study suggest individuals already hold significantly more positive cognitive behavioural beliefs toward *using* condoms than negative beliefs. Therefore, if individuals are aware of the positive benefits of *using* condoms it would be unlikely that strengthening these beliefs would increase performance of condom-related behaviours (Ferrer et al. 2011; Norton et al. 2005). However, reminding individuals of the benefits of performing condom-related behaviours, and changing negative affective attitudes may be likely to change behaviour (Ferrer et al. 2011). Similarly, as practicing safer sex does not happen in isolation (Bennett and Bozionelos 2000), acknowledging the fact that individuals elicit more referents who would approve of them performing these condom-related behaviours would be useful to strengthen through intervention (Agnew 2000; Terry 1993).

In chapter 1 (section 1.3.4, page 27) it was highlighted that PBC is often a weak predictor of condom *use*. In this sample, individuals elicited similar numbers of positive and negative control beliefs, suggesting they are aware of the difficulties controlling condom-related behaviours, because such behaviours involve interaction with a sexual partner (Conner, Graham and Moore 1999; Giles, Liddell and Bydawell 2005; Kiene, Tennen and Armeli 2008). This finding suggests that for interventions, focussing on affective and normative beliefs may be more useful targets than control beliefs. It also suggests that interventions to promote condom-related behaviours may be more suited to an extended TRA rather than an extended TPB, given the difficulties with controlling condom-related behaviours (Albarracín et al. 2001). Using the TRA for intervention development would be consistent with Fishbein's (1993: xxi) statement "I can think of no better use of the TRA than for it to be employed in the battle against AIDS."

2.4.4 Population differences in number of beliefs elicited toward performing five condom-related behaviours

Findings from this study suggest that different populations do not elicit different numbers of extended TPB beliefs toward the five-condom related behaviours. However results suggested that all populations do appear to hold more positive cognitive and normative beliefs toward performing five-condom related behaviours. This finding suggests that a safer sex intervention could be developed applicable to a broad population as they hold a similar number of both positive and negative beliefs toward the five condom-related behaviours (Montano et al. 2001; Sumartojo et al. 1997).

A reason why there may not be any differences in the number of beliefs elicited between the populations could be due to that for individuals in long term relationships, either because of using other forms of contraception, or no longer needing to use contraception due to being post-menopausal (Gott and Hinchliff 2003; Hinchliff, Gott and Ingleton 2010), they may not have performed these condom-related behaviours for some time, and as a result have similar feelings toward these behaviours as younger individuals (Schick et al. 2010). It is interesting that in this sample, neither younger nor older males produced any more negative affective beliefs toward condom *use* than females, as the literature suggests males are more likely to have negative feelings towards condom *use*, often acquired from past experience (Cooke and Sheeran 2004; Sadeghi-Nejad et al. 2010; Sheeran, Abraham and Orbell 1999; Zimmerman et al. 2007). Arguably therefore, as beliefs do not appear to differ between the populations explored in this study, developing an intervention targeting multiple condom-related behaviours applicable to a broad population seems appropriate.

2.4.5 Responding to an online questionnaire

The second aim of this elicitation study was to determine whether a broad range of individuals would respond to an online survey. This was important as the literature review argued that future safer sex interventions should be designed to target a broader population, including individuals who are often overlooked in

safer sex campaigns (section 1.2.3, page 14), and delivered online in order to reach a broad population at low cost (section 1.4.3, page 42). Although a convenience sample was used to select individuals who may respond to a request to participate in research, a wide age range of individuals answered the request. In this study, internet users aged between 13 and 74 years were able to access the link to the study, follow onscreen instructions, and write responses to the open-ended questions. However, similar to other studies both on and offline, more females responded to the email request for participants than males (Bosnjak, Tuten and Wittmann 2005; Restall and Strutt 2008). As a wide age range of individuals responded to the survey it meant that it would be appropriate for the other studies in this thesis to be conducted online.

2.4.6 Study limitations

A number of limitations within the current study must be acknowledged. The recommended sample size for elicitation studies are around 25 individuals (Francis et al. 2004), which this study achieved. However, when sampling a broad population's beliefs about five condom-related behaviours this could be considered rather small. This is due to broad populations consisting of various age groups, sexual orientations, ethnicities, genders and sexual experience. In this sample although each of these populations were sampled, in some instances, for example with sexual orientations, only one lesbian shared their beliefs, and only three non-Caucasians participated. Therefore, it could be that the beliefs elicited are not truly representative of a broad population. Future elicitation research would be required to determine whether the beliefs identified in this sample would be similar in a larger sample of the broad population, similar to elicitation studies exploring exercise behaviour (e.g., Darker et al. 2007).

In addition, although convenience sampling is widely used in exploratory research (Sommer and Sommer 1997), it does mean that only individuals who were approached to participate were given the opportunity to respond to the request. Future online elicitation studies may be better suited to opportunistic

sampling methods, where a larger range of individuals with access to the internet would have the opportunity to participate (Murray 2004). Although individuals motivated to participate in research are still likely to be those who respond (Hartman et al. 2002), it would allow a larger and possibly more representative sample to be obtained (Pequegnat et al. 2007).

Finally, the online software did not allow for the order of the elicitation questions to be randomised. Only the order of the condom-related behaviours in response to the elicitation question could be set to appear in a random order to reduce response fatigue. Darker et al. (2007: 95) argued that because “elicitation studies tend to elicit TPB beliefs in the same order: behavioural beliefs followed by normative beliefs followed by control beliefs”, there may be more behavioural than normative or control beliefs elicited. However, Darker et al. (2007) manipulated the order of beliefs in their elicitation research and results suggested the order of presentation did not alter the number of beliefs elicited. Therefore, it may be assumed that in this study, presenting the open-ended questions in the order commonly used in elicitation studies (Ajzen 2006b), did not impact on the number of beliefs elicited for each TPB construct. Furthermore, it has been argued that individuals responding to open-ended questions may not wish to repeat themselves, and therefore give responses only in one of the elicitation questions (Grice 2002). Yet in this sample there were some overlaps in beliefs elicited to the different open-ended questions, for example, safety as an affective and cognitive behavioural belief, and beliefs relevant to one’s partner were elicited as attitudinal, normative and control beliefs. This finding suggests that individuals felt they could repeat themselves across TPB elicitation questions, and the TPB constructs may not be viewed as mutually exclusive to participants (Miniard and Cohen 1981).

2.5 Conclusion

These findings have added to the limited existing literature on condom-related behaviours other than condom *use*. The beliefs generated demonstrated that individuals may hold both positive and negative beliefs toward performing these five condom-related behaviours as would be expected based on the existing

literature. Generally, more positive cognitive and normative beliefs were elicited. For example, in terms of cognitive attitudes, individuals indicated that they believe that performing these condom-related behaviours will *protect from unwanted pregnancy* and *STIs*, which is the primary aim of promoting safer sex practices. However, in terms of affective attitudes negative feelings such as feeling *embarrassed* and the *impact on the sexual act* appear to be more salient than positive feelings. Beliefs elicited in this study were used to develop a TPB questionnaire capturing indirectly-measured affective, cognitive, normative and control beliefs and directly-measured attitude, SN and PBC constructs from the TPB. This questionnaire was then used to identify beliefs to target in an online safer sex intervention which is the focus of chapter 3.

Chapter 3

Identifying intervention targets: A cross-sectional investigation of five condom-related behaviours using the ACNUD scale

3.1 Introduction

Chapter 2 of this thesis identified affective, cognitive, normative, and control beliefs associated with performing five condom-related behaviours; *accessing*, *carrying*, *negotiating*, *using* and *disposing* (ACNUD). This chapter will describe a questionnaire study using the ACNUD scale a broad population, to determine which beliefs and condom-related behaviours should be targeted in a safer sex intervention. Understanding the beliefs most predictive of intention to perform condom-related behaviours is the third step in being able to design a TPB-based intervention to change behaviour (Ajzen 2006a; Montano et al. 2001; Sutton 2002). To date, limited published research has explored beliefs relevant to predicting or changing condom-related behaviours beyond those associated with actual condom *use*. In addition, population sub-groups have tended to be the focus of the existing literature (e.g., gay men, adolescents). Arguably, research assessing the predictive utility of the broader populations' beliefs associated with a range of condom-related behaviours may contribute to the efficacy of public health interventions aimed at increasing condom *use*.

3.1.1 Identifying beliefs to target in an intervention

The literature reviewed in chapter 1 of this thesis suggested that to increase the predictive value of the TRA and TPB, the attitudes construct should explore both affective and cognitive beliefs, and the subjective norm (SN) construct should be expanded to include other normative beliefs such as moral norm (MN) and descriptive norm (DN) (section 1.3.6, page 29). Consequently, the ACNUD scale developed for the current study included modally salient affective and cognitive beliefs from the elicitation study. In terms of normative beliefs to include in the ACNUD scale, MN rather than DN was included for all five condom-related behaviours. The rationale for this is that existing literature indicates that this psychological construct significantly increases the variance

explained in intention to *use* (Conner, Graham and Moore 1999; Godin et al. 2005), and *carry* (Arden and Armitage 2008) condoms when included in the TPB. Research also suggests that for gay males, there is a perceived moral obligation to communicate that condom *use* should occur (Elwood, Greene and Carter 2003). In TPB studies that have included MN as an additional predictor of intention, the way this is measured varies by study. Some have included this within the normative beliefs, whilst others have regarded this as a separate construct (section 1.3.6, page 29). For the ACNUD scale, a decision was made to include MN alongside other normative beliefs that were frequently reported by participants in the elicitation study.

Hamilton and White (2011: 136) state that “belief-behaviour relations are fundamental to providing preliminary evidence to support the usefulness of targeting a belief in a behavioural intervention.” In order to determine the beliefs to be targeted in a safer sex intervention, a questionnaire study needs to be undertaken in a sample representative of the intended intervention population (Sutton 2002). Typically these questionnaire studies use a cross-sectional design so that data may be collected from a representative sample without manipulating the study environment (Cooke and French 2011). Analysis of data collected from questionnaire studies enable the “critical beliefs underlying intentions” to be identified (von Haeften et al. 2001: 155). These beliefs can then be altered in a number of ways in a behavioural intervention, such as “increasing the belief strength that using a condom will reduce the risk of becoming infected with HIV” (Sutton 2002: 195). This approach to identifying beliefs to target in TPB-based interventions has been successfully used to develop many safer sex interventions (e.g., Armitage and Talibudeen 2010; Bryan, Aiken and West 1996; Montano et al. 2001; Schaalma et al. 1996). This approach was taken in the present questionnaire study to identify beliefs to target in a condom promotion intervention.

3.1.2 Relationship between TPB constructs

The TPB is a causal model of behaviour, where the indirectly-measured attitudinal, normative and control beliefs should be related to their

corresponding directly-measured TPB construct, the directly-measured TPB constructs related to intention, and intention related to behaviour (Ajzen 1991; Figure 1.1, page 21). In chapter 1 (section 1.3.2, page 22), the meta-analytic review by Albarracín et al. (2001) in relation to condom use, was described. Albarracín et al. (2001) explored the relationships between each of the indirectly- and directly-measured TPB constructs where no relationships according to the TPB should be present, for example, relationships between beliefs and intentions. The review by Albarracín et al. (2001) also explored measures of past and future behaviour and the causal relationships with TPB constructs; findings suggested that intentions and PBC correlated more strongly with past rather than future behaviour. Sutton (2002) suggests that future TPB studies should explore the relationships between all measured TPB constructs. Therefore, this recommendation was adopted in the present cross-sectional study for the reasons outlined in section 1.3.2.

3.1.3 “One size fits all” interventions

Safer sex interventions typically focus on ‘at risk’ populations such as adolescents (Jemmott and Jemmott 2000), and gay males (Harding et al. 2001). Whilst these population-specific interventions are necessary, failure to include heterosexuals (Bowleg 2011), and older individuals (Bodley-Tickell et al. 2008), in safer sex interventions may be contributing to the annual rise in STIs in these groups (Health Protection Agency [HPA] 2012; 2011; 2010a; Schick et al. 2010). This evidence suggests a need to identify beliefs toward condom-related behaviours that are predictive of intention to perform these condom-related behaviours in a broader population (Montano et al. 2001). When developing a broad population intervention, researchers need to determine whether different populations vary in the target beliefs identified for intervention target (Montano et al. 2001). This is crucial, if target beliefs differ between the ‘at risk’ populations and the populations typically overlooked in safer sex interventions (Bodley-Tickell et al. 2008; Sumartojo et al. 1997), then a “one size fits all” intervention may not be appropriate (Montano et al. 2001).

Sutton (2002) argues that if an intervention aims to increase intention to perform a given condom-related behaviour, such as *carrying*, then beliefs identified as targets in an intervention must be enhanced in order to strengthen intention to perform this behaviour. Strengthening intentions may lead to future performance of behaviour when required (Fishbein and Ajzen 2010). However, in a meta-analysis exploring the effects of behavioural intervention that aimed to strengthen intentions on behaviour change, Webb and Sheeran (2006: 249) argued that “a medium-to-large change in intention ($d = 0.66$) leads to a small to a small-to-medium change in behaviour ($d = 0.36$).” This finding needs to be considered for “one size fits all” intervention, where behaviour change may not currently be required.

In terms of promoting condom-related behaviours, this argument is particularly relevant for behavioural interventions which include individuals currently in a relationship. Individuals in committed monogamous relationships may have *negotiated* to stop practicing safer sex (Beckman and Harvey 1996), as trusting one’s sexual partner has been cited as one aspect of a mutually-exclusive sexual partnership (see also section 1.2.2, page 12; Willig 1994). Furthermore, in terms of birth control for individuals in heterosexual relationships, long-acting reversible contraception such as progesterone implants are often chosen over barrier methods (Faculty of Sexual and Reproductive Health Care 2009), as they are believed not to interrupt the sexual act (Baker et al. 1995). Health promotion activity however needs to take account of the fact that relationships and other valid reasons for non-use of condoms are transitory; long-term relationships may break down, for example, and new sexual relationships form. Adolescents are often described as having a series of monogamous relationships (Bolton, McKay and Schneider 2010), and the rise in divorce rates maybe be contributing to a rise in STIs in the older population (Hope 2012; Office for National Statistics 2011b). It is therefore important to promote safer sex in individuals currently in a relationship (Nusbaum and Rosenfeld 2004), as well as individuals who are not currently sexually active (Brown, Hurst and Arden 2011). Strengthening intentions to perform condom-related behaviours in

a broad population may serve a future protective function. For example, if an individual's relationship status changes or an individual becomes sexually active, stronger intentions may lead to behaviour given the resources and opportunities to perform the behaviour (Fishbein and Ajzen 2010). Therefore, it is necessary to identify the beliefs to target in a safer sex intervention that are most predictive of intention to perform condom-related behaviours in a broad population and ensure that in different sub-populations (e.g., individuals currently in and not in a relationship) these beliefs are also those most predictive of intention.

3.1.4 Purpose of the study

This questionnaire study used an extended TPB framework to explore which affective, cognitive, normative, and control beliefs from the ACNUD scale were most predictive of intention to perform five condom-related behaviours in a broad population sample. The study had two aims (section 1.6.2, page 50). The first aim was to identify beliefs to target in an online safer sex intervention (the second stage of TPB-based intervention development; Ajzen 2006a; Sutton 2002; section 3.1.1, page 109). The second aim was to determine whether different populations vary in the target beliefs identified, which is crucial for development of a “one size fits all” intervention (section 3.1.3, page 111).

In addition, based on the literature reviewed in the introduction of this chapter, and in previous chapters (e.g., section 1.2.2, page 12), it was expected that (1) relationships would exist between extended TPB constructs where theoretically no relationships should exist, (2) beliefs most predictive of intention to perform condom-related behaviours in a broad population could be identified as targets for intervention, and (3) sub-populations may differ in the beliefs found to be most predictive of intention to perform condom-related behaviours.

3.2 Method

3.2.1 Design

The current study adopted a cross-sectional, online questionnaire-based design to identify beliefs and condom-related behaviours to target in an intervention promoting safer sex. Measures included affective and cognitive attitudes, SN, perceived behavioural control (PBC), intention and self-reported past behaviour for five condom-related behaviours.

3.2.2 Participants

Opportunistic sampling was used to recruit participants. This non-probability sampling method is widely used in health research (Russell and Shaw 2009). Eight hundred and seventy-nine participants accessed the questionnaire via web-links. Of those who accessed the questionnaire, 640 participants completed the demographic section and then closed the questionnaire, 363 completed all sections of the online questionnaire giving an overall response rate of 41.3%. Table 3.1 (page 115) shows the demographic characteristics of the whole sample, the proportion of the sample that completed the demographic section only, and final sample that completed the full TPB questionnaire.

Representativeness check

Similar to first study reported in this thesis (section 2.2.2, page 61), data were re-grouped for analysis purposes (Appendix 2: Data re-grouping categories). Chi-square analysis was undertaken on those who did and did not complete the TPB questionnaire section. No differences were found in terms of education level ($\chi^2(2) = 0.16$, $p = .69$), sexual orientation ($\chi^2(1) = 2.66$, $p = .10$), relationship status ($\chi^2(1) = 3.02$, $p = .08$) or religious beliefs ($\chi^2(1) = 3.21$, $p = .07$). A larger proportion of males completed only the demographic section compared to females (53% versus 36% respectively), $\chi^2(1) = 17.83$, $p = .001$. A larger proportion of non-Caucasians completed only the demographic section compared to the Caucasian sample (59% versus 39% respectively), $\chi^2(1) = 17.29$, $p = .001$. An independent t -test was used to explore age differences between participants who did and did not complete the TPB measures.

Participants who completed only the demographics section of the questionnaire tended to be younger (mean = 22.88 versus 24.77 years respectively), than those who completed the full questionnaire, $t(629) = -2.70$, $p = .01$.

Table 3.1: Demographic comparisons of TPB questionnaire completers and non-completers

Demographic		Whole sample (n=640)	Completers (n=363)	Non-completers (n=277)
Age	Mean	23.95 years	24.77 years	22.88 years
	SD	8.76 years	10.04 years	6.57 years
Gender	Female (%)	370 (57.8)	236 (65.0)	134 (48.4)
	Male (%)	270 (42.2)	127 (35.0)	143 (51.6)
Education	Degree level (%)	579 (90.5)	328 (90.4)	251 (90.6)
	Below degree (%)	61 (9.5)	35 (9.6)	26 (9.4)
Ethnicity	Caucasian (%)	516 (80.6)	312 (86.0)	204 (73.6)
	Non- Caucasian (%)	124 (19.4)	51 (14.0)	73 (26.4)
Sexual Orientation	Heterosexual (%)	553 (83.3)	321 (88.4)	232 (83.8)
	Gay male (%)	35 (5.5)	18 (5.0)	17 (6.1)
	Lesbian (%)	10 (1.6)	1 (0.3)	9 (3.2)
	Bisexual (%)	42 (9.6)	23 (6.3)	19 (6.9)
Relationship status	In a relationship (%)	419 (65.5)	248 (68.3)	171 (61.7)
	Not in a relationship (%)	221 (34.5)	115 (31.7)	106 (38.3)
Religiosity	No religious beliefs (%)	340 (53.1)	189 (52.1)	151 (54.5)
	Practicing religion (%)	125 (19.5)	63 (17.3)	62 (22.4)
	Not practicing religion (%)	175 (27.4)	111 (30.6)	64 (26.9)
Sexual Experience	Virgin (%)	59 (9.2)	20 (5.5)	39 (14.1)
	Non-Virgin (%)	581 (90.8)	343 (94.5)	238 (85.9)

3.2.3 Measures

Demographics

Age, gender, ethnicity, highest level of education, sexual orientation, relationship status, religiosity and sexual experience were collected as these intrinsic factors have been found to influence condom-related behaviours (Conner and Norman 2009; see also sections 1.2.2 and 1.2.3, pages 12 and 14).

Piloting the TPB measures

Prior to the main questionnaire study being undertaken, the ACNUD scale was piloted using Ajzen's (2006b) recommended expectancy-value measures for the indirectly-measured TPB constructs (affective, cognitive, normative and control beliefs) (see also chapter 1 section 1.3.2, page 22). The beliefs used to capture the indirectly-measured TPB constructs had been obtained through the elicitation study reported in chapter 1. The ACNUD scale was piloted in a sample representative of individuals who would participate in the intervention study (reported in chapter 4), as TPB questionnaire development guidelines recommend (e.g., Ajzen 2006b; Francis et al. 2004; Sutton 2002).

Initially fifty-five participants started to complete the scale; however, only thirty participants completed all five scales. The participant drop-out through-out the scale is likely to be due to expectancy-value measures adding considerably to the length of the scale. Participants were required to respond to questions concerning five condom-related behaviours rather than one behaviour typical of most TPB-based studies (e.g., De Wit, Victoir and Van den Bergh 1997b). Therefore it was likely that expectancy-value measures were seemingly repetitive for participants to complete resulting in attrition through-out the scales. Consequently, the final version of the ACNUD scale used only belief-based measures to keep the scale items to a minimum (Pequegnat et al. 2007; Zemoire, Kaskuas and Alcohol Research Group 2009). This approach has been adopted for other TPB studies exploring one condom-related behaviour (e.g., Armitage and Talibudeen 2010; De Wit, Victoir and Van den Bergh 1997b).

TPB measures used in the main questionnaire study

The TPB constructs were both directly- and indirectly-measured as recommended by Ajzen (2006b). Indirectly-measured TPB constructs (affective, cognitive, normative, and control beliefs) used belief-based measures. Three items measured the affective, cognitive, normative, and control beliefs for each condom-related behaviour. Intentions and self-reported condom-related behaviours were measured on two items, and the directly-measured TPB constructs were measured on one item per construct (Appendix 6: Copy of ACNUD scale). In total, the number of items in the ACNUD scale was less than 150, which has been recommended as a limit of items for online questionnaires (Pequegnat et al. 2007). Tables 3.2 to 3.6 (pages 118 to 122) show the characteristics of the five questionnaires that constitute the ACNUD scale.

Ajzen (2006b) suggests that internal consistency is a way of measuring reliability in directly-measured TPB constructs, but is not an assumption reasonable for indirectly-measured constructs, as individuals may hold ambivalent beliefs, where both positive and negative beliefs are present. For all condom-related behaviours, only one item measured the directly-measured TPB constructs, therefore it was not possible to calculate internal consistency. The use of single items for directly-measured TPB constructs is common to aid brevity of scales (e.g., van Oort, Schröder and French 2011), which was particularly important for the current study measuring five condom-related behaviours. Internal consistency using Cronbach's alpha (Cronbach 1951) was explored for the indirectly-measured TPB constructs for each condom-related behaviour. But as Ajzen (2006b) predicts, these reliabilities were often low. Cronbach's alpha coefficients for the indirectly-measured TPB constructs are shown in Tables 3.2 to 3.6 (pages 118 to 122).

Table 3.2: Characteristics of the accessing scale measures

Behaviour	TPB construct	Item example	Scale anchors	Number of items	Mean	Standard Deviation	Reliability coefficient
Accessing	Intention	I intend to access condoms every time I have sex in the future	1 (<i>strongly disagree</i>) and 7 (<i>strongly agree</i>)	2	4.39	1.96	0.80
	Indirectly-measured affective beliefs	Accessing condoms makes me feel self-conscious	1 (<i>not at all</i>) and 7 (<i>very much</i>)	3	3.14	1.85	0.89
	Indirectly-measured cognitive beliefs	I like the convenience of accessing condoms	1 (<i>strongly disagree</i>) and 7 (<i>strongly agree</i>)	3	3.66	1.10	0.19
	Indirectly-measured normative beliefs	My religion supports me accessing condoms	1 (<i>strongly disagree</i>) and 7 (<i>strongly agree</i>)	3	4.48	1.29	0.57
	Indirectly-measured control beliefs	I am more likely to access condoms if I am in close proximity to a vending machine	1 (<i>strongly disagree</i>) and 7 (<i>strongly agree</i>)	3	4.33	1.15	0.30
	Self-reported behaviours	1) Please estimate how often you have accessed condoms in the past month	1) 1 (<i>never</i>) and 7 (<i>every day</i>)	2	6.00	1.48	N/A
		2) Have you ever accessed condoms	2) Yes or No	1	N/A	N/A	N/A
	Directly-measured attitude	For me to access condoms in advance of having sex is	1 (<i>extremely bad</i>) and 7 (<i>extremely good</i>)	1	5.62	1.38	N/A
	Directly-measured SN	I feel social pressure to access condoms	1 (<i>strongly disagree</i>) and 7 (<i>strongly agree</i>)	1	2.92	1.74	N/A
	Directly-measured PBC	It is up to me whether or not I access condoms in advance of having sex	1 (<i>strongly disagree</i>) and 7 (<i>strongly agree</i>)	1	5.72	1.61	N/A

Note: N/A signifies these were single item or dichotomous measures

Table 3.3: Characteristics of the carrying scale measures

Behaviour	TPB construct	Item example	Scale anchors	Number of items	Mean	Standard Deviation	Reliability coefficient
Carrying	Intention	I plan to carry condoms in the future in case I have sex	1 (<i>strongly disagree</i>) and 7 (<i>strongly agree</i>)	2	4.30	1.91	0.81
	Indirectly-measured affective beliefs	Carrying condoms makes me feel self-conscious	1 (<i>not at all</i>) and 7 (<i>very much</i>)	3	3.35	1.22	0.43
	Indirectly-measured cognitive beliefs	Carrying condoms makes it look like you're 'after it'	1 (<i>strongly disagree</i>) and 7 (<i>strongly agree</i>)	3	4.45	1.14	0.17
	Indirectly-measured normative beliefs	Health Care Professionals think I should carry condoms	1 (<i>strongly disagree</i>) and 7 (<i>strongly agree</i>)	3	4.43	1.46	0.74
	Indirectly-measured control beliefs	I am more likely to carry condoms if I am in a new or casual relationship	1 (<i>strongly disagree</i>) and 7 (<i>strongly agree</i>)	3	5.47	1.31	0.64
	Self-reported behaviours	1) Please estimate how often you have carried condoms in the past month	1) 1 (<i>never</i>) and 7 (<i>every day</i>)	2	5.35	2.30	N/A
		2) Have you ever carried condoms	2) Yes or No	1	N/A	N/A	N/A
	Directly-measured attitude	For me to carry condoms in case I have sex is	1 (<i>extremely bad</i>) and 7 (<i>extremely good</i>)	1	5.18	1.60	N/A
	Directly-measured SN	I feel social pressure to carry condoms	1 (<i>strongly disagree</i>) and 7 (<i>strongly agree</i>)	1	2.77	1.71	N/A
	Directly-measured PBC	It is up to me whether or not I carry condoms in case I have sex	1 (<i>strongly disagree</i>) and 7 (<i>strongly agree</i>)	1	5.98	1.46	N/A

Note: N/A signifies these were single item or dichotomous measures

Table 3.4: Characteristics of the negotiating scale measures

Behaviour	TPB construct	Item example	Scale anchors	Number of items	Mean	Standard Deviation	Reliability coefficient
Negotiating	Intention	I plan to negotiate using condoms in the future every time I have sex	1 (<i>strongly disagree</i>) and 7 (<i>strongly agree</i>)	2	4.26	1.91	0.76
	Indirectly-measured affective beliefs	Negotiating condom use makes me feel trustworthy	1 (<i>not at all</i>) and 7 (<i>very much</i>)	3	3.31	1.32	0.54
	Indirectly-measured cognitive beliefs	You are more likely to be protected from sexually transmitted disease if you negotiate using condoms	1 (<i>strongly disagree</i>) and 7 (<i>strongly agree</i>)	3	4.55	1.08	0.25
	Indirectly-measured normative beliefs	Health Care Professionals think I should negotiate using condoms with a partner	1 (<i>strongly disagree</i>) and 7 (<i>strongly agree</i>)	3	4.67	1.27	0.62
	Indirectly-measured control beliefs	I am more likely to negotiate using condoms if my sexual partner wants me to	1 (<i>strongly disagree</i>) and 7 (<i>strongly agree</i>)	3	5.29	1.31	0.59
	Self-reported behaviours	1) Please estimate how often you have negotiated condom use in the past month	1) 1 (<i>never</i>) and 7 (<i>every day</i>)	2	5.87	1.57	N/A
		2) Have you ever negotiated using condoms	2) Yes or No	1	N/A	N/A	N/A
	Directly-measured attitude	For me to negotiate using condoms before having sex is	1 (<i>extremely bad</i>) and 7 (<i>extremely good</i>)	1	5.19	1.53	N/A
	Directly-measured SN	I feel social pressure to negotiate using a condom	1 (<i>strongly disagree</i>) and 7 (<i>strongly agree</i>)	1	3.01	1.76	N/A
	Directly-measured PBC	It is up to me whether or not I negotiate to use a condom before having sex	1 (<i>strongly disagree</i>) and 7 (<i>strongly agree</i>)	1	5.27	1.84	N/A

Note: N/A signifies these were single item or dichotomous measures

Table 3.5: Characteristics of the using scale measures

Behaviour	TPB construct	Item example	Scale anchors	Number of items	Mean	Standard Deviation	Reliability coefficient
Using	Intention	I intend to use a condom every time I have sex in the future	1 (<i>strongly disagree</i>) and 7 (<i>strongly agree</i>)	2	4.20	2.07	0.86
	Indirectly-measured affective beliefs	Using condoms makes me feel spontaneous	1 (<i>not at all</i>) and 7 (<i>very much</i>)	3	3.38	0.95	0.18
	Indirectly-measured cognitive beliefs	Using condoms is a safe thing to do	1 (<i>strongly disagree</i>) and 7 (<i>strongly agree</i>)	3	5.18	1.03	0.31
	Indirectly-measured normative beliefs	My family thinks that I should use condoms	1 (<i>strongly disagree</i>) and 7 (<i>strongly agree</i>)	3	4.76	1.58	0.74
	Indirectly-measured control beliefs	I am more likely to use a condom if my partner also wants to	1 (<i>strongly disagree</i>) and 7 (<i>strongly agree</i>)	3	5.14	1.15	0.45
	Self-reported behaviours	1) Please estimate how often you have used condoms in the past month	1) 1 (<i>never</i>) and 7 (<i>every day</i>)	2	5.53	1.78	N/A
		2) Have you ever used condoms	2) Yes or No	1	N/A	N/A	N/A
	Directly-measured attitude	For me to use condoms during sexual intercourse is	1 (<i>extremely bad</i>) and 7 (<i>extremely good</i>)	1	5.60	1.48	N/A
	Directly-measured SN	I feel social pressure to use condoms	1 (<i>strongly disagree</i>) and 7 (<i>strongly agree</i>)	1	3.29	1.96	N/A
	Directly-measured PBC	It is up to me whether or not I use condoms during sexual intercourse	1 (<i>strongly disagree</i>) and 7 (<i>strongly agree</i>)	1	4.91	2.05	N/A

Note: N/A signifies these were single item or dichotomous measures

Table 3.6: Characteristics of the disposing scale measures

Behaviour	TPB construct	Item example	Scale anchors	Number of items	Mean	Standard Deviation	Reliability coefficient
Disposing	Intention	I intend to dispose of a used condom every time I have sex in the future	1 (<i>strongly disagree</i>) and 7 (<i>strongly agree</i>)	2	5.55	1.67	0.60
	Indirectly-measured affective beliefs	Disposing of a used condom makes me feel embarrassed	1 (<i>not at all</i>) and 7 (<i>very much</i>)	3	3.40	1.10	0.19
	Indirectly-measured cognitive beliefs	Disposing of condoms interrupts the sexual act	1 (<i>strongly disagree</i>) and 7 (<i>strongly agree</i>)	3	4.42	1.16	0.15
	Indirectly-measured normative beliefs	My religion supports me disposing of a condom after use	1 (<i>strongly disagree</i>) and 7 (<i>strongly agree</i>)	3	4.46	1.28	0.58
	Indirectly-measured control beliefs	I am more likely to dispose of a condom if there is a bin close	1 (<i>strongly disagree</i>) and 7 (<i>strongly agree</i>)	3	4.51	1.42	0.65
	Self-reported behaviours	1) Please estimate how often you have disposed of a used condom in the past month	1) 1 (<i>never</i>) and 7 (<i>every day</i>)	2	5.87	1.66	N/A
		2) Have you ever disposed of a used condom	2) Yes or No	1	N/A	N/A	N/A
	Directly-measured attitude	For me to dispose of condoms after sexual intercourse is	1 (<i>extremely bad</i>) and 7 (<i>extremely good</i>)	1	5.52	1.54	N/A
	Directly-measured SN	I feel social pressure to dispose of condoms	1 (<i>strongly disagree</i>) and 7 (<i>strongly agree</i>)	1	2.69	1.63	N/A
	Directly-measured PBC	It is up to me whether or not I dispose of a condom after use	1 (<i>strongly disagree</i>) and 7 (<i>strongly agree</i>)	1	5.02	1.91	N/A

Note: N/A signifies these were single item or dichotomous measure

Item presentation

The order of item presentation within each condom-related behaviour scale was the same for each participant (Table 3.7). But items pertaining to the five condom-related behaviours were set to appear in random order for each participant, as generated by the online questionnaire software. The random presentation of items for the five condom-related behaviours was used in an attempt to reduce response fatigue.

Table 3.7: Item presentation order

Questionnaire component	Question number
Intention (1)	1
Affective Attitudes	2
Directly-measured Attitude	3
Cognitive Beliefs	4
Behaviour (1)	5
Normative Beliefs	6
Directly-measured SN	7
Control Beliefs	8
Intention (2)	9
Behaviour (2)	10
Directly-measured PBC	11

3.2.4 Procedure

Ethical approval was obtained from the Faculty of Health and Life Sciences at Coventry University before data collection commenced (Appendix 7: Ethical approval). Recruitment took place over two calendar months. Links to the questionnaire were put on five websites;

- Facebook; (www.facebook.com)
- MOODLE; (<http://students.coventry.ac.uk>)
- SONA; (<http://coventry.sona-systems.com>)
- AgeUK; (www.ageuk.org.uk)
- SASH; (www.healthinterventions.co.uk).

Links were also emailed to individuals who had expressed an interest in participating in this study from participation in the elicitation study and piloting of the questionnaire (e.g., section 2.2.4, page 64). As in the elicitation study, participants created a unique personal identifier to ensure that data could be withdrawn if required (section 2.2.4). When participants clicked on the link to the

questionnaire they were initially presented with the participant information sheet embedded in the online questionnaire. Subsequent sections contained the participant consent form, questionnaire instructions; the ACNUD scale, a 'thank you' page, and a participant debrief sheet directing participants to sexual health support if completing the questionnaire had raised concerns for them.

3.2.5 Data analysis

A series of analyses were conducted on the data. For all these analyses, the mean of the belief items for each TPB construct, and each ACNUD scale were used. In order to test the first hypothesis (section 3.1.4, page 113), a series of Pearson's correlation analyses explored the relationship between the measured TPB constructs for each ACNUD scale. Procedures recommended by Sutton (2002) correlating each of the indirectly- and directly-measured TPB constructs were followed (section 3.3.1, page 124). To test the second hypothesis (section 3.1.4), recommendations by von Haeften et al. (2001) to use a two-stage analysis were followed. In the first recommended analysis, a series of Pearson's correlations were performed, each belief measured in the ACNUD scale was correlated with the corresponding condom-related behaviour intention measure. In the second recommended analysis, a series of linear regression analyses were undertaken for each condom-related behaviour, the beliefs significantly correlated with intention to perform each condom-related behaviour identified in step one were entered simultaneously into the regression (section 3.3.2, page 127). Finally, to test the third hypothesis (section 3.1.4), a series of 2 x 2 MANOVA analyses were performed. For these MANOVA analyses, the beliefs identified to be the strongest predictors of intention for each condom-related behaviour in section 3.3.2, were entered as independent variables and the demographic measures as dependent variables (section 3.3.3, page 131).

3.3 Results

3.3.1 Relationships between indirectly- and directly-measured TPB constructs

In order to test the first hypothesis, where it was expected that relationships would exist between extended TPB constructs where theoretically no relationships should exist, a series of Pearson's correlation analyses were

undertaken between all indirectly- and directly-measured TPB constructs (Table 3.8, page 126). In terms of theoretically assumed relationships between indirectly- and directly-measured TPB constructs, results suggested that affective beliefs towards *accessing*, *negotiating*, *using* and *disposing* behaviours were all significantly correlated with directly-measured attitude. Cognitive beliefs were significantly related to directly-measured attitude for *negotiating* and *using* behaviours. Normative beliefs were significantly related to directly-measured SN for *accessing*, *carrying*, *negotiating*, *using* and *disposing* behaviours. Control beliefs were significantly related to directly-measured PBC for *carrying* and *negotiating* behaviours.

Of the directly-measured theoretical constructs, attitude and SN were significantly related to intention for all five condom-related behaviours. PBC was significantly related to intention for *carrying* and *negotiating* behaviours. For all five condom-related behaviours, intention appears significantly related to self-reported past performance of these behaviours.

Research has demonstrated that condom *use* behaviour may be correlated with underlying beliefs, and self-reported behaviour may be related to directly-measured TPB constructs (e.g., Albarracín et al. 2001). Data presented in Table 3.8 (page 126) suggest that both affective and cognitive beliefs are significantly correlated with self-reported past *accessing* behaviour. Normative beliefs appear significantly correlated with all self-reported past performance of all five condom-related behaviours. However, no control beliefs were significantly correlated with past performance of any of the five condom-related behaviours. In addition, these data suggest that directly-measured attitude is significantly related to self-reported past performance of all five condom-related behaviours. However for directly-measured SN, *carrying* was the only behaviour significantly correlated with self-reported past performance of this behaviour. Directly-measured PBC was not significantly related to self-reported past performance of any of the five condom-related behaviours.

Table 3.8: Correlations between all TPB constructs for each ACNUD scale

	TPB	Beh	1	2	3	4	5	6	7	8
1	Affective beliefs	A								
		C								
		N	-							
		U								
		D								
2	Cognitive beliefs	A	-0.13**							
		C	0.35**							
		N	0.34**	-						
		U	0.26**							
		D	0.14**							
3	Directly-measured Attitude	A	-0.11*	0.07						
		C	-0.10	0.08						
		N	-0.15**	0.15**	-					
		U	0.26**	0.39*						
		D	0.14**	0.08						
4	Normative beliefs	A	-0.02	0.12**	0.27**					
		C	0.11*	0.20**	0.40**					
		N	0.14**	0.29**	0.32**	-				
		U	0.30**	0.37**	0.54**					
		D	0.15**	0.06	0.34**					
5	SN	A	0.13**	0.08	-0.05	0.21**				
		C	0.21**	0.23**	0.06	0.27**				
		N	0.32**	0.18**	-0.02	0.23**	-			
		U	0.19**	0.11*	0.11*	0.30**				
		D	0.21**	0.05	-0.01	0.21**				
6	Control beliefs	A	0.20**	0.03	-0.02	0.21**	0.17**			
		C	-0.10	0.23**	0.25**	0.20**	0.08			
		N	0.13**	0.28**	0.21**	0.37**	0.14**	-		
		U	0.02	0.25**	0.06	0.11*	0.16**			
		D	0.18**	0.16**	0.07	0.22**	0.16**			
7	PBC	A	-0.10	0.01	0.11*	0.14**	-0.06	0.08		
		C	-0.14**	0.10	0.19**	0.19**	0.02	0.34**		
		N	-0.07	0.26**	0.17**	0.09	-0.02	0.16**	-	
		U	-0.01	0.14**	0.15**	0.03	-0.12**	-0.01		
		D	-0.02	-0.09	0.04	0.10*	-0.05	0.05		
8	Intention	A	-0.01	0.19**	0.34**	0.41**	0.23**	0.07	0.04	
		C	-0.01	0.17**	0.53**	0.69**	0.23**	0.19**	0.11*	
		N	0.11*	0.30**	0.42**	0.45**	0.17**	0.23**	0.16**	-
		U	0.34**	0.35**	0.58**	0.66**	0.19**	0.04	0.06	
		D	0.16**	0.14**	0.44**	0.39**	0.11*	0.16**	-0.03	
9	Self-reported past behaviour	A	-0.14**	0.19**	0.16**	0.20**	0.07	-0.08	-0.06	0.33**
		C	0.09	0.06	0.36**	0.45**	0.20**	0.03	0.05	0.55**
		N	-0.06	0.01	0.20**	0.24**	0.02	-0.02	0.03	0.31**
		U	0.10	0.10	0.22**	0.39**	0.07	-0.02	-0.04	0.36**
		D	0.07	0.06	0.26**	0.18**	0.04	0.08	0.03	0.33**

Note: Beh = behaviour (ACNUD), *p<.05, **p<.01

Summary of correlational analyses

These data suggest that directly-measured attitudes and SN are significantly related to intentions to perform all five condom-related behaviour. But directly-measured PBC is only significantly related to intentions to perform *carrying* and *negotiating* behaviours. Relationships between constructs appear to exist where theoretically none should exist; both cognitive and normative beliefs are related to intention to perform all five condom-related behaviours. Self-reported past performance of all five condom-related behaviours appears related to intention to perform these behaviours.

3.3.2 Analyses to identify the beliefs to be targeted in an intervention

In order to test the second hypothesis, where it was expected that beliefs most predictive of intention to perform condom-related behaviours in a broad population could be identified as targets for intervention, the two sets of analyses recommended by von Haeften et al. (2001) were undertaken (section 3.2.5, page 124). The first analyses were a series of Pearson's correlations between the belief items and intention measures for each condom-related behaviour (Table 3.9, page 128). The second analyses were a series of linear regressions; affective, cognitive, normative and control beliefs significantly correlated with intention to perform the corresponding condom-related behaviour were entered simultaneously into the regression (Table 3.10, page 129). These regression analyses were undertaken for each condom-related behaviour (section 3.2.5).

Table 3.9 (page 128) shows that for *accessing* behaviour, one cognitive, two normative, and one control belief were significantly correlated with intention. These were therefore entered together in a linear regression following von Haeften et al's (2001) recommendations. Regression results suggested that the cognitive belief 'I like the convenience of accessing condoms', the normative belief 'My family thinks that I should access condoms', and the control belief 'I am more likely to access condoms if I am in close proximity to a vending machine' made significant contributions to the prediction of intention. Together these beliefs appeared to explain 35.1% of the variance in intention to access condoms (Table 3.10, page 129).

Table 3.9: Belief-intention correlations by condom-related behaviour

TPB construct	Belief	A	C	N	U	D
Affective	Self-conscious	.01	-.14**	-	-	-
	Embarrassed	-.02	-.25**	-.05	-.04	-.12**
	Awkward	-.02	-	-.01	-	-
	Responsible	-	.42**	-	-	-
	Trustworthy	-	-	.31**	-	-
	Safe	-	-	-	.40**	-
	Spontaneous	-	-	-	.26**	-
	Clean	-	-	-	-	.27**
	Pleasant	-	-	-	-	.15**
Cognitive	Harder for females	.05	-	.08	-	-
	No stigma	.06	-	-	-	-
	Liking the convenience	.25**	-	-	-	-
	Looking like you're "after it"	-	-.14**	-	-	-
	Looking prepared	-	.23**	-	-	-
	Avoid STI	-	.24**	.24**	.11*	-
	Control	-	-	.27**	-	-
	Safe	-	-	-	.26**	-
	Get to have sex	-	-	-	.30**	-
	Hygienic	-	-	-	-	.25**
	Man's job	-	-	-	-	.07
	Interrupts the sexual act	-	-	-	-	-.05
Normative	I think I should (MN)	-.01	.74**	.55**	.69**	.37**
	Family	.57**	-	-	.29**	-
	Religion	.30**	-	.04	-	.13**
	HCP	-	.37**	.38**	-	-
	Partner	-	.54**	-	.60**	.35**
Control	Vending machine proximity	.18**	-	-	-	-
	Late at night	-.04	-	-	-	-
	Need for them	-.02	-	-	-	-
	New/Casual relationship	-	.12*	.17**	-.05	-
	Partner	-	.19**	.12*	.02	-
	Intend to use	-	.13**	-	-	-
	Experience	-	-	.22**	-	-
	Religion/Culture	-	-	-	.11*	.11*
	Bin close	-	-	-	-	.20**
	At home	-	-	-	-	.06

Note: *p<.05, **p<.01, - signifies the belief was not measured for the condom-related behaviour

Table 3.10: Regression standardised beta weights (β), R^2 and F values, for individual beliefs predicting intention to perform condom-related behaviours

Behaviour	TPB construct	Beliefs	β	R^2	F
Accessing	Affective	N/A	N/A	.351	48.37**
		Liking the convenience	.11**		
	Cognitive	Family	.52**		
		Religion	.02		
	Control	Vending machine proximity	.11**		
Carrying	Affective	Self-conscious	-.06	.609	45.37**
		Responsible	.16**		
		Embarrassed	-.08		
	Cognitive	Looking like you're 'after it'	.00		
		Avoid STI	.07*		
		Looking prepared?	-.01		
	Normative	Health Care Professional (HCP)	.02		
		I think that I should (MN)	.57**		
		Partner	.11**		
	Control	New/ casual relationship	-.06		
		Partner	.08*		
		Intend to use them	-.02		
Negotiating	Affective	Trustworthy	.19**	.360	24.87**
		Control	.06		
	Cognitive	Avoid STI	.04		
		Health Care Professional (HCP)	.07		
		I think that I should (MN)	.44**		
	Normative	Partner	-.02		
		New/casual relationship	-.01		
		Experience	.03		
Using	Affective	Safe	.12**	.554	46.79**
		Spontaneous	.10**		
	Cognitive	Safe	.00		
		Get to have sex	.09*		
		Avoid STI	-.02		
	Normative	Family	.04		
		Partner	.22**		
		I think I should (MN)	.47**		
	Control	Religion	.03		
Disposing	Affective	Clean	.17**	.248	12.95**
		Embarrassed	-.07		
		Pleasant	-.04		
	Cognitive	Hygienic	.14**		
		Partner	.18**		
		I think that I should (MN)	.18**		
	Normative	Religion	.06		
		Culture	-.07		
		Bin close	.18**		

Note: * $p < .05$, ** $p < .01$

For *carrying* behaviour, Table 3.9 (page 128) shows that all three affective, cognitive, normative, and control beliefs were significantly correlated with intention, and entered together in the regression analysis. Results suggested that the affective belief 'carrying condoms makes me feel responsible', the cognitive belief 'carrying condoms will ultimately avoid getting a sexually transmitted disease', one control belief 'I am more likely to carry condoms if my sexual partner wants me to', and two normative beliefs 'I think that I should carry condoms' (MN), and 'my sexual partner thinks that I should carry condoms', significantly contributed to the prediction of intention. Together these beliefs appeared to explain 60.9% of the variance in intention to *carry* condoms (Table 3.10, page 129).

For *negotiating* behaviour, Table 3.9 (page 128) shows that one affective, two cognitive, two normative, and three control beliefs were significantly correlated with intention, and entered together in the regression analysis. Results suggested that the affective belief 'negotiating condom use makes me feel trustworthy', and the normative belief 'I think that I should negotiate with a partner to use condoms' (MN) significantly contributed to the prediction of intention. Together these beliefs appeared to explain 36.0% of the variance in intention to *negotiate* condom use (Table 3.10, page 129).

For *using* behaviour, Table 3.9 (page 128) shows that two affective, three cognitive, three normative, and one control belief were significantly correlated with intention, and entered together in the regression analysis. Results suggested that two affective beliefs 'using condoms makes me feel safe', and 'using condoms makes me feel spontaneous', one cognitive belief 'using a condom means I get to have sex', and two normative beliefs 'my sexual partner thinks that I should use condoms', and 'I think I should use condoms' (MN) contributed to the prediction of intention. Together these beliefs appeared to explain 54.4% of the variance in intention to *use* condoms (Table 3.10, page 129).

For *disposing* behaviour, Table 3.9 (page 128) shows that three affective, one cognitive, three normative, and two control beliefs were significantly correlated

with intention, and entered together in the regression analysis. Results suggested that the affective belief ‘disposing of a used condom makes me feel clean’, the cognitive belief ‘it is hygienic disposing of condoms’, one control belief ‘I am more likely to dispose of a condom if there is a bin close’, and two normative beliefs ‘my sexual partner thinks that I should dispose of a condom after use’, and ‘I think that I should dispose of a condom after use’ (MN) significantly contributed to the prediction of intention. Together these beliefs appeared to explain 24.8% of the variance in intention to dispose of a used condom (Table 3.10, page 129).

Summary of findings from correlation and regression analyses

Findings suggest that affective and cognitive beliefs are generally related to intentions to perform for all five condom-related behaviours. However, affective beliefs appear more effective in predicting *carrying*, *negotiating* and *using* intentions than cognitive beliefs. Furthermore, MN rather than normative referents appear more predictive of *carrying*, *negotiating* and *using* intentions. Control beliefs appear to predict intentions for *accessing*, *carrying* and *disposing* behaviours. These analyses suggest that behaviours to target in an intervention would be *carrying*, *negotiating* and *using* as these behaviours have the strongest correlations with intention. According to recommendations by von Haeften et al. (2001), affective and MN beliefs should be targeted for these condom-related behaviours, as they appear to have the highest beta weights. Different affective beliefs ought to be targeted for different behaviours; feeling responsible appears the most predictive belief for *carrying* behaviour, feeling trustworthy for *negotiating* behaviour and feeling safe for *using* behaviour.

3.3.3 Analyses to ascertain whether a “one-size fits all” intervention is appropriate

In order to test the second hypothesis, where it was expected that sub-populations may differ in the beliefs found to be most predictive of intention to perform condom-related behaviours, a series of 2 (demographic) x 2 (beliefs: affective and MN) MANOVAs were performed. In the MANOVAs, each of the re-grouped demographic measures (Appendix 2: Data re-grouping categories) were entered as the dependent variable, and the two beliefs identified to be the

strongest predictors of intention, and therefore, targets for intervention were entered as independent variables. This analysis was required as the intervention that was to be produced as part of the thesis was intended to be aimed at a broad population which includes individuals of different genders, ages, sexual orientations, ethnicity, religious beliefs, sexual experience, relationship status and educational backgrounds. If different demographics have an impact on these identified beliefs, a “one size fits all” intervention may not be appropriate.

Table 3.11 (page 133) shows the means and standard deviations of the beliefs and condom-related behaviours identified for target in an intervention for each of the demographic sub-populations. The analyses suggested there were no differences between the sub-populations on the beliefs identified for *accessing* and *disposing* behaviours. But there were some sub-population differences for *carrying*, *negotiating* and *using* behaviours; these are shown by asterisks in Table 3.11. Results from the analyses identifying these differences are further outlined on page 134.

Table 3.11: Mean \pm SD of demographic measures, beliefs and condom-related behaviours identified for intervention target

		Affective			Moral Norm		
		C	N	U	C	N	U
Demographic		Responsible	Trustworthy	Safe			
Age	Younger (≤ 39)	4.48 \pm 1.63	4.29 \pm 1.74	5.65 \pm 1.52*	4.39 \pm 1.94	4.91 \pm 1.78	5.18 \pm 2.00
	Older (≥ 40)	4.45 \pm 1.70	4.48 \pm 1.66	4.97 \pm 1.80	4.34 \pm 1.86	4.45 \pm 1.55	5.28 \pm 1.75
Gender	Female	4.92 \pm 1.63	4.38 \pm 1.74	5.64 \pm 1.56	4.20 \pm 1.96**	4.81 \pm 1.89	5.22 \pm 1.99
	Male	4.65 \pm 1.65	4.21 \pm 1.75	5.51 \pm 1.59	4.73 \pm 1.86	4.96 \pm 1.54	5.10 \pm 1.99
Education	Degree level	4.40 \pm 1.70	4.43 \pm 1.69	5.17 \pm 1.77	4.17 \pm 1.99	4.54 \pm 1.63	4.94 \pm 2.04
	Below degree level	4.87 \pm 1.63	4.31 \pm 1.75	5.64 \pm 1.54	4.41 \pm 1.94	4.90 \pm 1.79	5.20 \pm 1.98
Ethnicity	Caucasian	4.77 \pm 1.60	4.23 \pm 1.72*	5.57 \pm 1.54	4.31 \pm 1.98	4.79 \pm 1.77	5.11 \pm 2.01
	Non-Caucasian	5.18 \pm 1.82	4.88 \pm 1.80	5.71 \pm 1.74	4.82 \pm 1.65	5.29 \pm 1.78	5.63 \pm 1.80
Sexual Orientation	Heterosexual	4.82 \pm 1.67	4.26 \pm 1.75	5.55 \pm 1.57	4.31 \pm 1.93	4.88 \pm 1.78	5.15 \pm 1.98
	Gay	4.85 \pm 1.42	4.85 \pm 1.64	5.85 \pm 1.53	5.00 \pm 1.92	4.73 \pm 1.73	5.39 \pm 2.05
Relationship Status	In a relationship	4.68 \pm 1.74**	4.18 \pm 1.75*	5.45 \pm 1.67*	3.94 \pm 1.94**	4.72 \pm 1.86*	4.68 \pm 2.10*
	Not in a relationship	5.14 \pm 1.36	4.63 \pm 1.69	5.90 \pm 1.26	5.36 \pm 1.56	5.17 \pm 1.54	6.25 \pm 1.15
Sexual Experience	Virgin	4.10 \pm 2.05*	4.00 \pm 1.72	5.15 \pm 1.54	4.36 \pm 1.95	5.20 \pm 1.44	5.70 \pm 1.30
	Non-Virgin	4.85 \pm 1.61	4.33 \pm 1.73	5.63 \pm 1.54	4.85 \pm 1.60	4.85 \pm 1.78	5.16 \pm 2.01
Religiosity	Religious	4.63 \pm 1.84	4.52 \pm 1.76	5.35 \pm 1.75	4.37 \pm 1.99	5.18 \pm 1.87	4.97 \pm 2.05
	Not Religious	4.86 \pm 1.60	4.28 \pm 1.74	5.64 \pm 1.53	4.39 \pm 1.93	4.80 \pm 1.75	5.22 \pm 1.98

Note: Asterisks represent univariate test of difference within each demographic variable. * $p < .05$, ** $p < .01$

For *carrying* behaviour, using Wilks' Lambda statistic (Λ), findings from the MANOVAs suggested there were differences between genders on the two beliefs ($\Lambda = .97$, $F(2,360) = 6.61$, $p = .002$, $\eta_p^2 = .04$). As shown in Table 3.11 (page 133), univariate follow-up tests revealed a significant effect for MN beliefs ($F(1, 361) = 6.33$, $p = .01$, $\eta_p^2 = .02$). Examination of the means suggested males appear to have a stronger MN to *carry* condoms than females (Table 3.11). Similarly, differences were found between relationship status on the two beliefs ($\Lambda = .88$, $F(2,360) = 23.76$, $p = .001$, $\eta_p^2 = .12$). Univariate follow-up tests revealed a significant effect of affective beliefs concerning feeling responsible ($F(1, 361) = 6.33$, $p = .01$, $\eta_p^2 = .02$), and MN beliefs ($F(1,361) = 47.60$, $p = .001$, $\eta_p^2 = .12$). Examination of the means suggested individuals not in a relationship appear to have stronger beliefs that *carrying* condoms is a responsible thing to do, and a stronger MN belief to *carry* condoms than individuals in a relationship. Differences were found between virgins and non-virgins on the two beliefs ($\Lambda = .98$, $F(2,356) = 3.96$, $p = .02$, $\eta_p^2 = .02$). Univariate follow-up tests revealed a significant effect for affective beliefs concerning responsibility ($F(1,357) = 10.61$, $p = .05$, $\eta_p^2 = .01$). Examination of the means suggested non-virgins appeared to have a stronger affective belief that *carrying* condoms feels responsible. Therefore for *carrying* behaviour, just four differences were found out of a possible 16 demographic differences in beliefs measured.

For negotiating behaviour, MANOVA findings suggested there were differences between ethnicities on the two beliefs ($\Lambda = .98$, $F(2,360) = 4.18$, $p = .02$, $\eta_p^2 = .02$). Univariate follow-up tests revealed a significant effect of affective beliefs concerning feeling trustworthy ($F(1, 361) = 6.24$, $p = .01$, $\eta_p^2 = .02$). Examination of the means suggested non-Caucasians appeared to have stronger affective beliefs that *negotiating* condom use makes you feel trustworthy. Similarly, differences were found between relationship status on the two beliefs ($\Lambda = .98$, $F(2,360) = 4.42$, $p = .01$, $\eta_p^2 = .02$). Univariate follow-up tests revealed a significant effect of affective beliefs concerning feeling trustworthy ($F(1, 361) = 5.19$, $p = .02$, $\eta_p^2 = .01$), and MN beliefs ($F(1,361) = 5.16$, $p = .02$, $\eta_p^2 = .01$). Examination of the means suggested individuals not in a relationship appear to have stronger beliefs that *negotiating* condom use makes you feel trustworthy, and a stronger MN belief

to *negotiate* condom use than individuals in a relationship. Therefore for *negotiating* behaviour, just three differences were found out of a possible 16 demographic differences in beliefs measured.

For *using* behaviour, MANOVA findings suggested there were differences between age groups on the two beliefs ($\Lambda = .98$, $F(2,356) = 3.59$, $p = .03$, $\eta_p^2 = .02$). Univariate follow-up tests revealed a significant effect of affective beliefs concerning safety ($F(1, 357) = 5.31$, $p = .02$, $\eta_p^2 = .02$). Examination of the means suggested younger individuals appeared to have stronger beliefs that *using* condoms is a safe thing to do than older individuals. Similarly, differences were found between relationship status on the two beliefs ($\Lambda = .86$, $F(2,360) = 28.36$, $p = .001$, $\eta_p^2 = .14$). Univariate follow-up tests revealed a significant effect of affective beliefs concerning safety ($F(1, 361) = 6.79$, $p = .01$, $\eta_p^2 = .02$), and MN beliefs ($F(1,361) = 56.55$, $p = .001$, $\eta_p^2 = .14$). Examination of the means suggested individuals not in a relationship appear to have stronger beliefs that *using* condoms is a safe thing to do and a stronger MN to *use condoms* than individuals in a relationship. Therefore for *using* behaviour, just three differences were found out of a possible 16 demographic differences in beliefs measured. Arguably therefore, results from these MANOVA analyses suggest that a “one size fits all” intervention targeting targets affective and MN beliefs toward *carrying*, *negotiating* and *using* behaviours in a broad population would be appropriate as out of a possible 48 differences only 10 were found.

3.4 Discussion

The present cross-sectional questionnaire study reports the identification of beliefs and condom-related behaviours to target in a safer sex intervention study applicable to a broad population. The primary aim of this study was to identify beliefs to target in an intervention, which is the second phase of TPB-based intervention development (Ajzen 2006a; Sutton 2002). However, the literature suggests that in order to use the TPB to design interventions, the ability of theory to predict the behaviours under investigation needs to be explored (Finlay, Trafimow and Moroi 1999). Similarly, beliefs identified as targets for intervention manipulation need to predict intention to perform the target behaviour(s) for the

target population (Montano et al. 2001). Therefore, this study explored the relationship between TPB constructs and whether a “one size fits all” intervention for use in a broad population would be appropriate. These analyses contribute to the existing literature on the application of the TPB toward exploring multiple condom-related behaviours, and identifying intervention target beliefs for broad population samples.

The first hypothesis tested predicted that relationships would be present between extended TPB constructs where theoretically no relationships should exist. Findings from these analyses largely supported the general hypothesised pattern of effects in the TPB, but with several noteworthy variations. Ajzen and Fishbein (1980) argue that intention is the proximal determinant of behaviour. As expected for the five condom-related behaviours being explored, intention to perform these behaviours appeared to be significantly related to self-reported past performance of these behaviours. However, Ajzen (1991) also argues that directly-measured PBC can have a direct relationship with behaviour, yet this relationship was not present for any of the five condom-related behaviours. Similarly, as expected, relationships were present between both directly-measured attitude and SN, and intention for all five condom-related behaviours. But this relationship was not found between directly-measured PBC and intention, only *carrying* and *negotiating* behaviours had this expected relationship. Other unexpected relationships found will be discussed in section 3.4.1 (page 137).

The second hypothesis tested predicted that beliefs most predictive of intention to perform condom-related behaviours in a broad population could be identified as targets for intervention. Analyses suggested that affective and MN beliefs should be the critical targets for intervention in order to increase intentions to perform, and performance of condom-related behaviours. Furthermore, analyses also suggested three condom-related behaviours; *carrying*, *negotiating*, and *using* should be the focus of the intervention. The literature which supports the rationale for targeting these beliefs and condom-related behaviours in an intervention is discussed in section 3.4.2 (page 140).

The third hypothesis tested predicted that sub-populations may differ in the beliefs found to be most predictive of intention to perform condom-related behaviours. Results suggested that generally in this sample few differences were found between the sub-populations in the beliefs identified for target in the intervention. The differences found, and the rationale to implement a “one size fits all intervention” are discussed in section 3.4.3 (page 144).

3.4.1 Relationship between TPB constructs

Assumed theoretical relationships

In this sample, for *using* behaviour, the intention-past behaviour correlation of .36 in this study compares favourably with the significant relationship Albarracín et al. (2001) reported in their meta-analysis exploring the application of the TPB to condom *use*. Similarly, results from this study support findings from other studies reporting non-significant relationships between directly-measured PBC and condom *use* intentions (e.g., Reinecke, Schmidt and Ajzen 1996; see also section 1.3.4, page 27). This finding suggests that directly-measured PBC is not able to capture the complexity of perceived control over intimate sexual contact involving these five condom-related behaviours (Barkely and Burns 2000; Brien and Thombs 1994). Furthermore, as the majority of this sample were sexually experienced, these individuals are more likely to perceive the difficulties of performing condom-related behaviours, as they may have had previous experience with performing the behaviour (Bennett and Bozionelos 2000; Terry 1993). Arguably therefore, in terms of TPB-based interventions targeting multiple condom-related behaviours, PBC and underlying control beliefs would not be useful targets for intervention in order to change intentions.

Consistent with the literature, the attitude-intention relationships appeared to be stronger than the SN-intention relationships for all five condom-related behaviours (e.g., Trafimow 2001). This result suggests that in this sample, attitudes may be more likely to drive behaviour, and therefore useful to target in an intervention. However, the significant SN-intention relationships for all five condom-related behaviours, suggests that SN should also be targeted in an intervention (Sutton 2002). These results suggest that for condom-related behaviours, it is the constructs of the TRA rather than the TPB, which have stronger relationships with

intention. In terms of performing condom-related behaviours, there is a close interaction between personal and social influences on these behaviours. Hee (2000) argues that effects of an individual's attitudes on intention to undertake behaviour are reliant on SN, and vice versa. This argument is particularly relevant for *negotiating* and *using* behaviours, which may have to be performed with co-operation from a sexual partner. Arguably therefore, both attitudes and SN are key targets for safer sex interventions promoting condom *use*.

In the present study, the relationships between indirectly- and directly-measured TPB constructs support the argument of McEachan et al. (2011), that such relationships tend to be moderate at best, and are often non-significant. In terms of TPB-based interventions, which are based on changing underlying beliefs, although exploration of the relationships between indirectly- and directly-measured TPB constructs is useful, it is not crucial that the correlational relationships between constructs are strong. This is due to TPB-based interventions targeting beliefs that are predictive of intention to perform behaviours (von Haften et al. 2001).

Relationship between affective and cognitive attitudes

Crites, Fabrigar and Petty (1994) argue that affective and cognitive attitudes are related but distinct constructs. In the present study, data confirms that for all five condom-related behaviours this is the case. Results suggest that affective beliefs are related to directly-measured attitude for *accessing*, *negotiating*, *using* and *disposing* behaviours. For cognitive beliefs, results suggest these are related to directly-measured attitude for *negotiating*, *using* and *disposing* behaviours. The finding that for *carrying* behaviour, neither affective nor cognitive beliefs appeared to be significantly related to directly-measured attitude could be due to two reasons. First, the beliefs measured may not have been salient in this sample (Fisher 1984). Alternatively, De Wit, Victoir and Van den Bergh (1997b) demonstrated that for condom *use*, feelings of 'protection' and 'promiscuity' were not related to directly-measured attitude; these beliefs are similar to the 'responsible' and 'after-it' belief measures in the current study for *carrying* behaviour. This suggests that there may genuinely not be a relationship between attitudinal beliefs and directly-measured attitude for *carrying* behaviour. Arguably

therefore, an intervention could focus on either affective or cognitive attitudes towards these five condom-related behaviours. However, the literature suggests it is the attitudinal beliefs that are most predictive of intention to perform condom-related behaviours which should be the focus of an intervention (von Haeften et al. 2001). Therefore, section 3.4.2 (page 140) discusses which attitudinal beliefs should be the focus of the intervention study reported in chapter 4.

Non-assumed theoretical relationships

These data show similar results to other studies which demonstrate relationships are present between TPB constructs, where theoretically these would not be expected (Ajzen 1991; 2006a; Albarracín, Fishbein and Middlestadt 1998; Albarracín et al. 2001). For example, directly-measured attitude for all five condom-related behaviours appeared significantly related to self-reported past behaviour. Similarly, normative beliefs were related to both directly-measured attitude and intention, a finding previously reported by Kashima, Gallois and McCamish (1992). These data support Sutton's (2002) argument that exploratory correlations should be undertaken between all measured TPB constructs to determine where relationships may be present which are not expected from the assumptions of the TPB (Ajzen 1991). Exploring these non-assumed theoretical relationships is important as it has been suggested that behaviour may be directly influenced by indirectly-measured beliefs (Albarracín, Fishbein and Middlestadt 1998; Rhodes et al. 2009), and the social aspect of many behaviours means that attitudes and SN become related but distinct constructs (Hee 2000). Theoretically, targeting beliefs most predictive of intention to perform condom-related behaviours will change intentions to perform, and potentially performance of condom-related behaviours when required.

Predicting intention

One of the criticisms of the TPB is that it fails to explain a large proportion of the variance in intention and behaviour (e.g., Rutter and Quine 2002). The main aim of this study was to identify beliefs and condom-related behaviours that could be targeted in a safer sex intervention. In order to identify these beliefs, the recommendations by von Haeften et al. (2001) were followed. In the paper by von Haeften et al. (2001), they report that 11 beliefs explain 57.8% of the variance in

intention to *use* condoms. In this study, findings compared favourably with von Haeften et al. (2001), results suggested that 55.4% of the variance in intention to *use* condoms was explained by nine beliefs (Table 3.10, page 129). The current study has made a unique contribution to the TPB literature by showing that a small number of beliefs explain a medium-large proportion of the variance in *accessing*, *carrying*, *negotiating* and *disposing* behaviours. These findings support the use of the TPB to predict intention to perform condom-related behaviours (Ajzen 1991), and as a theory which can be used to identify beliefs to target in behaviour change interventions (Ajzen 2006a; Fishbein and Ajzen 2010).

3.4.2 Beliefs to be targeted in an intervention

In terms of intervention design, von Haeften et al. (2001: 154) state that “although theoretically beliefs should be more strongly related to attitude, SN and PBC than to intentions, identifying the underlying beliefs that have the strongest influence on intentions should increase the potential effectiveness of an intervention.” Following von Haeften et al’s (2001) recommended analysis, these data suggest that neither cognitive nor control beliefs would be useful beliefs to target in an intervention as they contributed little or nothing to the prediction of intention for any of the five condom-related behaviours. Data suggested that affective and normative beliefs should be the target in an intervention as these appear to predict the largest proportion of variance in intention (Table 3.10, page 129). Targeting the affective and normative beliefs most predictive of intention for multiple condom-related behaviours would be a novel approach to delivering a safer sex intervention (Arden and Armitage 2008). The rationale for the choice of condom-related behaviours and beliefs to be targeted in a safer sex intervention is discussed in the following sections.

Affective beliefs

For *accessing* behaviour, findings showed negative correlations between affective beliefs and intention as would be expected; stronger negative feelings result in less intention to *access* condoms consistent with other research findings (Moore et al. 2006). However, for *accessing* behaviour, none of the measured affective beliefs appeared to be significantly correlated with intention. As no beliefs were

significantly correlated with intention it would not be appropriate to target affective beliefs for *accessing* behaviour (von Haeften et al. 2001).

For *carrying* behaviour, beliefs about feeling ‘self-conscious’ and ‘embarrassed’ were negatively correlated with intention as would be expected; higher negative feelings result in weaker intentions to *carry* condoms (Hillier, Harrison and Warr 1998; Moore et al. 2006). Feeling ‘responsible’ by *carrying* condoms was positively correlated with intention as would be expected (Turner et al. 1994). However, when these beliefs were entered into the regression analysis, only the ‘responsible’ belief appeared to predict intention. The ‘responsible’ belief was therefore selected as an intervention target (von Haeften et al. 2001).

For *negotiating* behaviour, beliefs about feeling ‘embarrassed’ and ‘awkward’ were negatively correlated with intention as would be expected (Moore et al. 2006). However, these beliefs were not significantly correlated with intention so were not entered into the regression analysis. The ‘trustworthy’ affective belief was significantly positively correlated with intention as would be expected; higher feelings of trustworthiness result in higher intentions to *negotiate* condom use (Noar, Morokoff and Harlow 2002). This ‘trustworthy’ belief when entered into the regression analysis predicted intention, and was therefore selected as a target for intervention (von Haeften et al. 2001).

For *using* behaviour, the belief about feeling ‘embarrassed’ was negatively correlated with intention as expected (Moore et al. 2006), but this correlation was not significant and therefore was not entered into the regression analysis. Feelings of ‘safety’ and ‘spontaneity’ were both significantly positively correlated with intention as would be expected (Norton et al. 2005). When entered into the regression analysis the ‘safe’ belief was more predictive of intention than the spontaneous belief, therefore this belief was retained as a target for intervention. Promoting safety of oneself and one’s sexual partner by *using* condoms is typical of safer sex interventions (Mikolajczak, Kok and Hospers 2008). However, promoting feelings of ‘safety’ is less common, yet as Norton et al. (2005: 2493) argue, “interventions will have greater success by addressing affective reactions to condom use in addition to promoting the protective value of condoms.” This

argument further supports the inclusion of the ‘safe’ affective belief to target in a safer sex intervention.

For *disposing* behaviour, the belief about feeling ‘embarrassed’ was negatively correlated with intention as expected (Moore et al. 2006). Similarly as would be expected, feeling ‘clean’ and ‘pleasant’ beliefs were positively correlated with intention (von Haeften et al. 2001). When these three beliefs were entered into the regression analysis, only the belief of feeling ‘clean’ was a significant predictor of intention to dispose of a *used* condom, similar to von Haeften et al. (2001) who reported in their study that feeling ‘clean’ predicted condom *use*. Although this belief was predictive of intention to perform *disposing* behaviour, a decision was made not to target *disposing* behaviour in the online intervention. The rationale for this being that *disposal* of a used condom after sexual intercourse is an unavoidable behaviour if a condom has been used (Avert 2011b). Although condoms must be removed correctly to avoid semen spillage (Li et al. 2011), the planned online intervention aims to be brief, therefore targeting ‘pre-use’ *carrying* and *negotiating* behaviours, and *using* behaviour would support intervention brevity. Brief TPB-based interventions have been shown to change intentions (Armitage and Talibudeen 2010), and a brief intervention focussing on three rather than five condom-related behaviours would be well suited to a brief online intervention (Pequegnat et al. 2007).

Normative beliefs

Previous research has demonstrated that the attitude-behaviour relationship may be strengthened by perceived normative support (White, Hogg and Terry 2002). This suggests that including promotion of normative support in an intervention may be important. Findings from this study suggest that the MN beliefs associated with *carrying*, *negotiating*, *using* and *disposing* behaviours are the most predictive of intention. Arguably therefore, MN beliefs should be targeted in an online intervention, as research suggests that when individuals are anonymously expressing their normative beliefs, these can be strengthened by social identity (Smith, Terry and Hogg 2007). In terms of social identity, there is a perceived moral correctness to the practice of safer sex (Richard and Van der Pligt 1991), and practicing safer sex is viewed favourably by various normative referents

particularly health promoters (NHS Choices 2010). Strengthening the MN belief for *carrying*, *negotiating* and *using* behaviours in a safer sex intervention may strengthen intentions, and change behaviour (Jellema et al. 2013; Parker, Manstead and Stradling 1995).

Although MN has been chosen to be the focus of the intervention, other normative referents which were found to be predictive of intention in this study are similar to that found in other research. For example, one's sexual partner was found to be predictive of intention for *carrying*, *using* and *disposing* behaviours, consistent with other research (e.g., Armitage and Talibudeen 2010, Bolton, McKay and Schneider 2010). Similarly, in this study, the normative belief pertaining to one's family was predictive of intention to *access* condoms, and has previously been found to be a salient referent in research exploring *carrying* behaviour (Armitage and Talibudeen 2010).

Rationale for not targeting cognitive and control beliefs

In this study only two control beliefs were shown to be predictive of intention. First, for *accessing* behaviour, the belief that the 'proximity to a vending machine' would enable control over *accessing* condoms, a result consistent with other research (Sixsmith et al. 2006). Second, the belief that 'having a bin close' would enable condom disposal predicted *disposing* intention. The presence of *used* condoms in bins has been used as an outcome measure for exploring condom *use* in the sex worker population (Egger et al. 2000). However, as neither *accessing* nor *disposing* behaviours are to be targeted in the proposed intervention, and no control beliefs for the proposed target behaviours, *carrying*, *negotiating* and *using* were predictive of intention, it would not be appropriate to target control beliefs (von Haeften et al. 2001). These findings further support the arguments relating to the difficulty with PBC in the prediction of condom-related behaviours (section 1.3.4, page 27).

In terms of cognitive beliefs, these findings support authors that argue that affective beliefs are more predictive of intention than cognition (e.g., Lawton, Conner and McEachan 2009; see also section 1.3.6, page 29). In this study, *carrying*, *negotiating*, *using* and *disposing* affective beliefs were stronger

predictors of intention than cognitive beliefs. For *accessing* condoms, the cognitive belief of ‘convenience’ did predict intention, consistent with previous research (Galazios et al. 2004). Similarly, ‘avoiding STIs’ by *carrying* condoms was predictive of intention, which is a primary reason for promoting condom *carrying* (Arden and Armitage 2008). Furthermore, agreeing to *use* a condom with a sexual partner may be a factor which enables sexual intercourse to happen (De Bro, Campbell and Peplau 1994). In this study, the belief that ‘using a condom means you get to have sex’ was predictive of condom *use*. Focussing on the most predictive attitudinal beliefs would help to keep the intervention brief, which is recommended for online intervention delivery (Noar, Black and Pierce 2009).

Summary of beliefs and behaviours to be targeted in an online safer sex intervention

These analyses suggest that beliefs from an extended TRA rather than an extended TPB would be better suited to an online safer sex intervention targeting a broader population. Findings from this study support criticisms of the PBC construct in relation to condom *use* that weak, and often non-existent relationships are found between PBC and intention (e.g., Terry 1993). Strengthening positive feelings around ‘responsibility’, ‘trust’, and ‘safety’ alongside the moral aspects of performing these condom-related behaviours would be a novel approach to enhancing intentions, and potentially changing behaviour for relevant individuals, for example, those currently not in monogamous relationships.

3.4.3 Population differences in beliefs identified for target in an intervention

The differences found across the three condom-related behaviours identified for intervention target tended to be in terms of individuals currently in and not in relationships, as would be expected (Crosby et al. 2008). Although it has been argued that safer sex is more relevant to individuals currently not in committed monogamous relationships, safer sex is relevant to all sexually-active individuals, as relationship status may change (Bolton, McKay and Schneider 2010). In this study, individuals not in a relationship appear to report higher affective and MN beliefs across the three condom-related behaviours. This finding is encouraging, it suggests that in individuals for whom safer sex is more relevant; currently hold more positive affective and MN than individuals not in a relationship. This may

lead to these individuals practising safer sex (Bryan, Aiken and West 1996). However, this finding also suggests that because individuals currently in a relationship have less positive affective and MN beliefs, they may be less inclined to perform these condom-related behaviours if their relationship status were to change, which is consistent with the arguments that when relationships change individuals may not be performing these condom-related behaviours leading to risky sexual behaviour (Baker 2012; Cook 2012).

Other differences found between beliefs identified for target in the intervention in this study were also as would be expected from the literature. For example, younger individuals appeared to report stronger feelings of safety relating to condom *use* than older individuals, suggesting that the safer sex messages typically targeted at younger individuals may be having a positive effect on affective attitudes (Blank et al. 2010). However, this finding adds to the argument that older individuals should be targeted in safer sex interventions (Bodley-Tickell et al. 2008), strengthening their affective beliefs may well serve to change intentions and subsequent behaviour, so that they may feel that *using* condoms is a safe thing to do if the need to *use* condoms arises (Schick et al. 2010). Performance of condom-related behaviours is important for all individuals (Greene and Herek 1994; Nusbaum and Rosenfeld 2004). Arguably therefore, a “one size fits all” safer sex intervention for a broad population targeting affective and MN beliefs toward three condom-related behaviours would be useful from a public health perspective (Bowleg 2011; Department of Health 2011b; 2010; NICE 2007; Sumartojo et al. 1997).

3.4.4 Study limitations

A number of limitations within this study must be acknowledged. Although opportunistic sampling is widely used in health research (Russell and Shaw 2009), it does mean that only individuals who were motivated to complete the questionnaire took part in the study, a typical problem of questionnaire-based research (Pequegnat et al. 2007). As this study was promoted on social networking sites alongside the University’s website, and no incentive was given for completing the questionnaire (Webb 2010), it may be argued that the sample

completing the questionnaire may be typical of individuals who are willing to participate in research for no reward (Henderson et al. 2010).

Findings suggested that few control beliefs predicted intention, for this reason in the subsequent intervention study control beliefs will not be targeted as recommended by von Haeften et al. (2001). However, even though the literature suggests that PBC is a problematic construct in relation to condom *use* (Albarracín et al. 2001; Eagly and Chaiken 1993), and therefore likely to be problematic for other condom-related behaviours, it cannot be ruled out that the control beliefs identified to be included in the ACNUD scale were not salient for the population sampled in this study. Future research may need to consider using existing control beliefs from scales such as the CUSES (Brien and Thombs 1994), rather than attempting to elicit modally salient beliefs from the sample population. Although this approach would still likely find PBC differences are present in diverse populations (Barkely and Burns 2000). Finally, similar to the elicitation study, the online software did not allow for the order of the TPB items to be randomised. Only the order of the condom-related behaviours in response to the TPB question could be set to appear in a random order. The potential problems with this in relation to participants fatigue have been discussed in section 2.4.6 (page 106).

3.5 Conclusion

This study has added to the limited existing literature on the relationship between TPB constructs other than the causal relationship proposed by Ajzen and Fishbein (1980). The correlation analysis suggests that directly-measured attitude may be related to past behaviour, and normative beliefs may be related to intention for the five condom-related behaviours measured in the study. This study also demonstrated how statistical methods may be applied to identify multiple behaviours and beliefs to target in an intervention. These analyses suggest that an extended TRA may be a better model than the TPB for intervention to change condom-related behaviours. Affective beliefs and MN beliefs have been identified as ideal targets in an intervention as they demonstrated significant relationships with intention to *carry*, *negotiate*, and *use* condoms in a sample of demographically diverse individuals. Overall there appears to be few differences between sub-populations in the beliefs for intervention target. The main difference

being that individuals currently not in a relationship appear to have stronger affective and MN beliefs toward performing the condom-related behaviours identified for intervention target, an encouraging finding. A safer sex intervention targeting a broad population would be appropriate as a potential way to address the rise in STIs in populations often omitted from safer sex interventions (Bodley-Tickell et al. 2008, Bowleg 2011; HPA 2012). The beliefs identified in this study, as targets for a safer sex intervention, will be incorporated in the design and evaluation of a safer sex intervention study which is the focus of chapter 4.

Chapter 4

Changing three condom-related behaviour intentions and self-reported behaviour using an online intervention: Design, delivery and evaluation

4.1 Introduction

Chapter 3 of this thesis, identified that affective and moral norm (MN) beliefs should be targeted in an online safer sex intervention, as these beliefs significantly predicted *carrying*, *negotiating*, and *using* intention (section 3.3.2, page 127). This chapter explains the development and evaluation of an online safer sex intervention study promoting the performance of these three condom-related behaviours. Designing and delivering an intervention based on the research reported in chapters 2 and 3 of this thesis is the final stage of TPB-based intervention development (Ajzen 2006a; Sutton 2002). There are few published intervention studies to date that promote performance of multiple condom-related behaviours (Bryan, Aiken and West 1996), and none promoting multiple condom related-behaviours using an online approach (Noar, Black and Pierce 2009). Furthermore, few theory-driven safer-sex interventions take a broad public health approach (Department of Health [DoH] 2011b), encompassing individuals of all ages for whom safer sex may be relevant at some point across the lifespan (Nusbaum and Rosenfeld 2004). By assessing the utility of an online safer sex intervention promoting the performance of three condom-related behaviours in a broad population, the current research will contribute to the existing literature on the feasibility and efficacy of public health interventions.

4.1.1 A “one size fits all” intervention

As discussed throughout this thesis, successful performance of safer sex requires a process of condom-related behaviours (e.g., section 2.1.1, page 53), and is important for a broad range of individuals across the lifespan (section 1.1, page 1). Developing a safer sex intervention which focuses on promoting multiple condom-related behaviours in a broad population should be relevant for all individuals, as some of these individuals may not yet be

sexually active, but *carrying* (or storing) condoms would allow them to be prepared for possible future sexual contact (Arden and Armitage 2008). There have been calls in the literature for more generalised interventions to include populations commonly overlooked in safer sex interventions, such as, older individuals (Bodley-Tickell et al. 2008), and individuals currently in monogamous sexual relationships (Harvey et al. 2009). Sumartojo et al. (1997: 1206) argued that HIV prevention interventions should be developed that target both ‘high-risk populations’ and the ‘general population’. Yet since this appeal, interventions have continued to target mainly ‘at-risk’ groups alone. Developing a brief “one size fits all intervention” is a cost effective method of promoting safer sex in a broad population, which may lead to global change in reducing health risk behaviours (Bennett and Glasgow 2009; Crosby and Rothenberg 2004; Noar and Willoughby 2012; Smith and Gordon 2009).

The research reported in chapters 2 and 3 of this thesis have sampled a broad range of individuals. For example; a wide age range and individuals of different sexual orientations, thus ensuring that the beliefs identified to be targeted in the online intervention in this chapter are as representative as possible of the population at which this intervention is aimed (Ajzen 2006a; Sutton 2002). Therefore, although the impact of the “one size fits all” intervention may be smaller compared to interventions targeting one ‘at-risk’ population (Noar, Black and Pierce 2009), and focussing on one condom-related behaviour (Hardeman et al. 2002), a broader population-focused intervention targeting multiple condom-related behaviours has the potential to be useful from a public health perspective (Fishbein and Capella 2006). Promoting condom-related behaviours may reduce the incidence of STIs, and unwanted pregnancies in a wide range of individuals (Clutterbuck et al. 2011; Crosby and Rothenberg 2004).

4.1.2 LifeGuide as a tool for intervention delivery

Section 1.4.3 (page 42) of the literature review introduced the ‘LifeGuide’ software, a free tool for researchers to develop online interventions (Hare et al.

2009). LifeGuide was chosen as the platform for the current study as there was no budget for commissioning a computer programmer to build an online intervention. To create an intervention in LifeGuide, researchers use the LifeGuide authoring tool to build web-pages, and connect these using simple programming logic (Osmond et al. 2009). LifeGuide logic includes a randomisation function, allowing for creation of randomised control interventions, which are often viewed as the 'gold standard' in terms of intervention evaluation (Stephenson, Imrie and Bonell 2003). To support researchers building LifeGuide interventions there is an online LifeGuide community, where researchers have access to help pages and the LifeGuide team, who can help with intervention development (Williams et al. 2010). Interventions built using LifeGuide require the intervention users to supply an email address, so that automated follow-up emails may be sent to remind users to complete subsequent intervention visits, and track the time users have spent on the different intervention web-pages (Williams et al. 2010). This enabled longitudinal data to be collected in the current study, and time spent reading the intervention material tracked allowing analysis on whether longer time spent reading intervention materials impacts on cognitive changes (Myint-U et al. 2010; Sniehotta, AraújoSoares and Dombrowski 2007).

To date, a variety of interventions have been built and delivered using LifeGuide. These include the *Internet Doctor*, providing tailored advice for individuals suffering from colds and flu-like symptoms (Joseph et al. 2009), an online self-management Cognitive Behavioural Therapy programme for individuals with Irritable Bowel Syndrome (Everitt et al. 2010), and a hand-washing intervention to reduce the transmission of respiratory infections and pandemic flu (Miller, Yardley and Little 2012). Miller, Yardley and Little's (2012) hand-washing intervention used persuasive messages to change intentions, affective and cognitive attitudes, subjective norms (SN) and perceived behavioural control (PBC) toward hand-washing. The intervention randomised individuals to one of four persuasive message conditions; low-threat/no coping message, low-threat/coping message, high-threat/no coping message and high-

threat/coping message. Findings suggested that individuals randomised to the high-threat/coping message condition had stronger hand-washing intentions post-intervention than those assigned to other conditions. Miller et al's (2012) study suggests that LifeGuide is a useful platform for delivery of a persuasive message-based intervention. Of the LifeGuide literature available, it appears that it has not yet been used to deliver a safer sex intervention. Therefore, using LifeGuide to deliver a TPB-based persuasive message intervention, promoting the performance of three condom-related behaviours in a broad population represents a novel application of the LifeGuide software.

4.1.3 Using persuasive messages to target identified beliefs

The elicitation study reported in chapter 2 of this thesis identified affective, cognitive, normative and control beliefs that individuals hold toward performing five condom-related behaviours; *Accessing, Carrying, Negotiating, Using* and *Disposing* (ACNUD). In chapter 3, affective and MN beliefs were found to be most predictive of intention to perform three behaviours (CNU), and therefore identified as targets for intervention. In chapter 1 (sections 1.1 and 1.4.1, pages 1 and 36), it was highlighted that TPB-based intervention typically use persuasive messages to change individuals' beliefs. According to Fishbein and Ajzen (2010) persuasive messages targeting underlying beliefs should strengthen the targeted belief and the corresponding directly-measured constructs within the TPB. In the present study therefore, a message targeting affective and MN beliefs should strengthen directly-measured attitudes and SN toward three condom-related behaviours (CNU). After identifying the beliefs and behaviours for intervention target, the content of the persuasive messages needed to be considered as part of the intervention development.

Historically, psychologists have been engaged in developing procedures for changing risky sexual behaviours (Bryne and Bryne 1977). This work remains a high priority given the high rates of STIs and unwanted pregnancies both in the UK (Health Protection Agency [HPA] 2012), and worldwide (World Health Organisation [WHO] 2009), and more relaxed societal attitudes towards sexual

contact outside of committed monogamous relationships (Braun-Courville and Rojas 2009; Johnson et al. 1994; Jowell et al. 2000). As discussed in chapter 1 (section 1.4.1, page 36), persuasive messages based on psychological constructs of the TPB are an effective way of changing intentions to perform, and performance of a range of health behaviours, including condom-related behaviours (e.g., Armitage and Talibudeen 2010; McCarty 1981). Using the internet for delivery, these persuasive messages have the potential to reach a wide audience with minimal implementation costs (Fogg 2003; Griffiths et al. 2006; Webb et al. 2010). However, in the health literature, there is an ongoing debate about the content of persuasive messages that will be most effective for changing health risk behaviours (e.g., Albarracín et al. 2005; Covey 2012; Gallagher and Updegraff 2012; Garcia-Retamero and Cokely 2011; Rotham et al. 2006, see also section 1.4.1).

To determine how to write the persuasive messages to ensure maximum impact in changing intentions (and behaviour for relevant individuals) in the current intervention study, the literature reviewed in chapter 1 was re-examined. In a meta-analytic review, Gallagher and Updegraff (2012) concluded that persuasive messages promoting safer sex appear to have a small effect ($r = .081$) on changing behaviour. The literature suggests that persuasive messages are typically written as either gain-framed or loss-framed appeals (e.g., Abhyankar, O’Conner and Lawton 2008; Gallagher and Updegraff 2012; Garcia-Retamero and Cokely 2011; Kiene et al. 2005; Rotham et al. 2006). A gain-framed appeal provides an assessment of outcomes associated with performing the safer sex behaviour, such as, “if you avoid having sex when you are drunk or using other drugs, you are more likely to practice safer sex and therefore you are at less risk of getting an STD or HIV” (Kiene et al. 2005: 323). Loss-framed appeals include assessments of outcomes associated with not performing the behaviour. For example, “many STDs don’t have symptoms, so if you don’t use condoms you can get an STD or HIV from a partner who doesn’t know that he/she is infected” (Kiene et al. 2005: 323). Cumulative evidence suggests that for preventative behaviours, such as safer sex, gained-framed messages are

significantly better than loss-framed messages at changing health risk behaviours (e.g., Gallagher and Updegraff 2012; Garcia-Retamero and Cokely 2011). But neither of these types of message framing considers the social context of safer sex. Blanton et al. (2001) suggest a different approach to persuasive message-framing based on social images of individuals who do (positively-framed message), and do not *use* condoms (negatively-framed message) (see also section 1.4.1, page 36).

Gibbons, Houlihan and Gerrard (2009) argue that the social context of behaviour, and affective attitudes toward behaviour, should be considered when attempting to change health behaviours, including condom *use*. The authors argue that the social context of health risk behaviours, such as condom *use*, and the impact these behaviours will have on an individual and others should be considered in interventions. This argument is consistent with the outcomes of the study to identify beliefs to target in an intervention described in chapter 3. The beliefs most predictive of intention to *carry*, *negotiate* use of, and *use* condoms were MN, and affective attitudes, which are well aligned with the social and emotional aspects of performing these condom-related behaviours. Fishbein and Ajzen (2010) argue that in order to change intentions and behaviour, an intervention needs to change the relevant salient behavioural, normative or control beliefs. Theoretically, persuasive messages based on emotional and social appeals, such as those targeting affective and MN beliefs, should therefore change the targeted beliefs.

A persuasive message which targets the affective and moral aspects of performing condom-related behaviours should engender change through individuals wishing to associate themselves with responsible, trustworthy and safe individuals and disassociate themselves with individuals who are not like this (Blanton et al. 2001; De Groot and Steg 2009; Lockwood et al. 2004; Schutz et al. 2011). Social responsibility-based appeals may be more effective than appeals targeting an individual's self-interest as they promote the moral reasons for performing a behaviour, i.e. protecting oneself and others (Bryan

and Hershfield 2012; Cialdini and Goldstein 2004). Fekadu and Kraft (2002: 25) argue that the “motivating force is the expectancy of gaining social approval or disapproval” from respectively performing or not performing recommended behaviours. For condom-related behaviours therefore, some authors suggest that accentuating the negative in persuasive messages is more likely to motivate behaviour change than accentuating the positive because individuals do not wish to associate themselves with the negatively portrayed individual (e.g., Blanton et al. 2001; Block and Keller 1995; Kiene et al. 2005; Rothman and Salovey 1997). In the current study, identifying the best method for targeting the personal and social factors associated with performing condom-related behaviours will be explored based on previous recommendations (Blanton et al. 2001; Hillier, Harrison and Warr 1998; Richard and van der Pligt 1991; Rothman et al. 2006; Terry 1993). Further exploration of message framing in relation to multiple condom-related behaviours will contribute to the existing literature exploring message framing only in relation to condom *use* (op. cit.). This study will help to ensure that future persuasive messages have maximum impact in changing intentions and behaviour.

The brief persuasive messages in the current study therefore, incorporated a test of message framing based on the recommendations of Blanton et al. (2001) exploring the effect of positive- and negative-message framing based on social images, on both affective and MN beliefs toward the three condom-related behaviours identified as targets for the intervention. Testing Blanton et al’s (2001) recommendations for multiple condom-related behaviours, rather than just one behaviour (condom *use*), will contribute to the existing health literature on the effects of message framing, and the literature on message framing in relation to TPB-based interventions (Abhyankar, O’Conner and Lawton 2008; O’Conner, Ferguson and O’Conner 2005). Targeting salient beliefs in the intended intervention population in order to strengthen intentions and change behaviour is key in TPB-based interventions (Ajzen 2006a; Fishbein and Ajzen 2010). However to date, few studies have explored message framing in relation to TPB constructs. Studies which have explored message framing within a TPB

framework have found that negatively-framed messages strengthen intentions and other TPB constructs better than positively-framed messages (e.g., Abhyankar, O’Conner and Lawton 2008; Levin, Schneider and Gaeth 1998; O’Conner, Ferguson and O’Conner 2005). Abhyankar, O’Conner and Lawton (2008: 4) argue that framing may “affect intention by increasing respondents’ perceptions of the efficacy of the target behaviour in producing expected outcomes.” In the current study, negatively-framed messages are more likely to engender changes in cognitions as individuals are likely to feel a moral obligation to perform condom-related behaviours (Godin et al. 2005), and therefore do not wish to be associated with individuals’ who do not perform these behaviours (Blanton et al. 2001).

4.1.4 Acceptability of persuasive messages

Persuasive messages designed to change health risk behaviours need to be acceptable to the target population (Macdonald et al. 2007). Triandis (1971: 159) stated that messages which are “clear, easy to understand, and do not make the audience defensive” are most likely to be accepted. This is particularly important for messages aimed at a broad population, where some persuasive messages may be viewed as more acceptable by certain sub-populations than others. Identifying the persuasive message most acceptable to the target audience may determine whether the message may be used in future public health campaigns (Fogg 2003). For web-based interventions, persuasive messages which take less than 10 minutes to read have been reported as being more acceptable than longer messages (Hallett et al. 2009). In terms of brief messages concerning condom *carrying* behaviour, Armitage and Talibudeen (2010) found that individuals reading persuasive messages which attempted to change the psychological constructs of the TPB viewed these messages as more acceptable than a control message about the history of the condom. However, it appears that few studies assess the acceptability of the persuasive messages presented. For these reasons, the current study included an item to measure message acceptability, to explore whether

control, positively- or negatively-framed messages are viewed as more acceptable to participants.

4.1.5 Purpose of the study

This online intervention study used an extended TPB framework to design and evaluate a safer sex intervention that promoted performance of three condom-related behaviours; *carrying*, *negotiating* and *using*. The aim of this study was to increase intentions and performance of these condom-related behaviours, through persuasive messages targeting the affective and MN beliefs identified as the most predictive of intention to perform the target condom-related behaviours.

In addition, based on the literature reviewed in the introduction of this chapter, and previous chapters (e.g., section 1.2.2, page 12) it was expected that (1) negatively-framed persuasive messages will increase self-reported performance of condom-related behaviours more effectively than positively-framed or control messages, (2) negatively-framed persuasive messages will strengthen the constructs from an extended TPB framework more effectively than positively-framed or control messages with respect to the condom-related behaviours, and (3) message acceptability is likely to differ depending on the message read.

4.2 Method

4.2.1 Design

The current study adopted a 3 (intervention condition: control, positively-, or negatively-framed) x 3 (time: T1/T2/T3) randomised controlled design. Measures pertaining to affective attitudes, MN, directly-measured attitude, SN, and PBC, intention and behaviour toward the three condom-related behaviours under investigation (*carrying*, *negotiating* and *using*) were taken at three time points; immediately prior to the intervention (T1) immediately post intervention (T2), and at 3-month follow-up (T3) (Appendix 8: Copy of measures).

4.2.2 Power analysis

A meta-analysis by Webb et al. (2010) reported an average mean effect size of $d = .16$ for the impact of internet interventions promoting healthy behaviours on behaviour change. Additionally, Webb et al. (2010) reported that internet interventions based on the TPB tend to have a larger average mean effect size of $d = .36$. But interventions targeting multiple behaviours tend to have a small average effect size of $d = .12$ (Webb et al. 2010). According to Cohen (1992) these are small to medium effect sizes. Faul et al's (2009) G*Power 3.1 was used to calculate the sample size required to detect a small effect size ($d = .20$) of between-within interaction with 0.80 power and $\alpha = .05$ using MANOVA based on 18 predictor psychological constructs. This calculation has been used in other TPB-based condom interventions (Armitage and Talibudeen 2010). The calculation recommended a minimum total sample size of 335 participants who needed to complete the intervention.

4.2.3 Participants

Similar to the previous study in this thesis, opportunistic sampling was used to recruit participants (section 3.2.2, page 114). Figure 4.1 (page 158) shows the flow of participants through the intervention at the three data collection points. Attrition from T1 to T2 was 11.0% resulting in 391 complete data sets, and from T2 to T3 60.4% resulting in 155 complete data sets. These attrition rates are similar to other online safer sex interventions (Pequegnat et al. 2007). Intention to treat analysis was used to address this attrition rate (section 4.2.7, page 166). Table 4.1 (page 159) shows the demographic characteristics of the T1, T2 and T3 samples.

Representativeness check

Demographic data were re-grouped for analytic purposes (Appendix 2: Data regrouping categories). Chi-square analyses were undertaken on those who did and did not complete the T3 measures. No differences were found in terms of gender ($\chi^2(1) = .99, p = .32$), ethnicity ($\chi^2(1) = 1.04, p = .31$), religious beliefs ($\chi^2(1) = .11, p = .75$), education ($\chi^2(1) = 2.51, p = .11$), sexual experience ($\chi^2(1) = .26, p = .61$), or relationship status ($\chi^2(1) = .74, p = .39$). A larger proportion

of individuals identifying themselves as gay did not complete the T3 measures compared to heterosexual individuals (79.5% versus 63.3% respectively), $\chi^2(1) = 4.10$, $p = .04$. An independent samples t -test was used to test age differences between participants who did and did not complete the T3 measures. Participants who did not complete the T3 measures tended to be significantly younger (mean = 29.82 versus 32.59 years respectively), than those who completed T3 measures, $t(437) = 2.19$, $p = .03$.

Figure 4.1: Flow of participants through the intervention

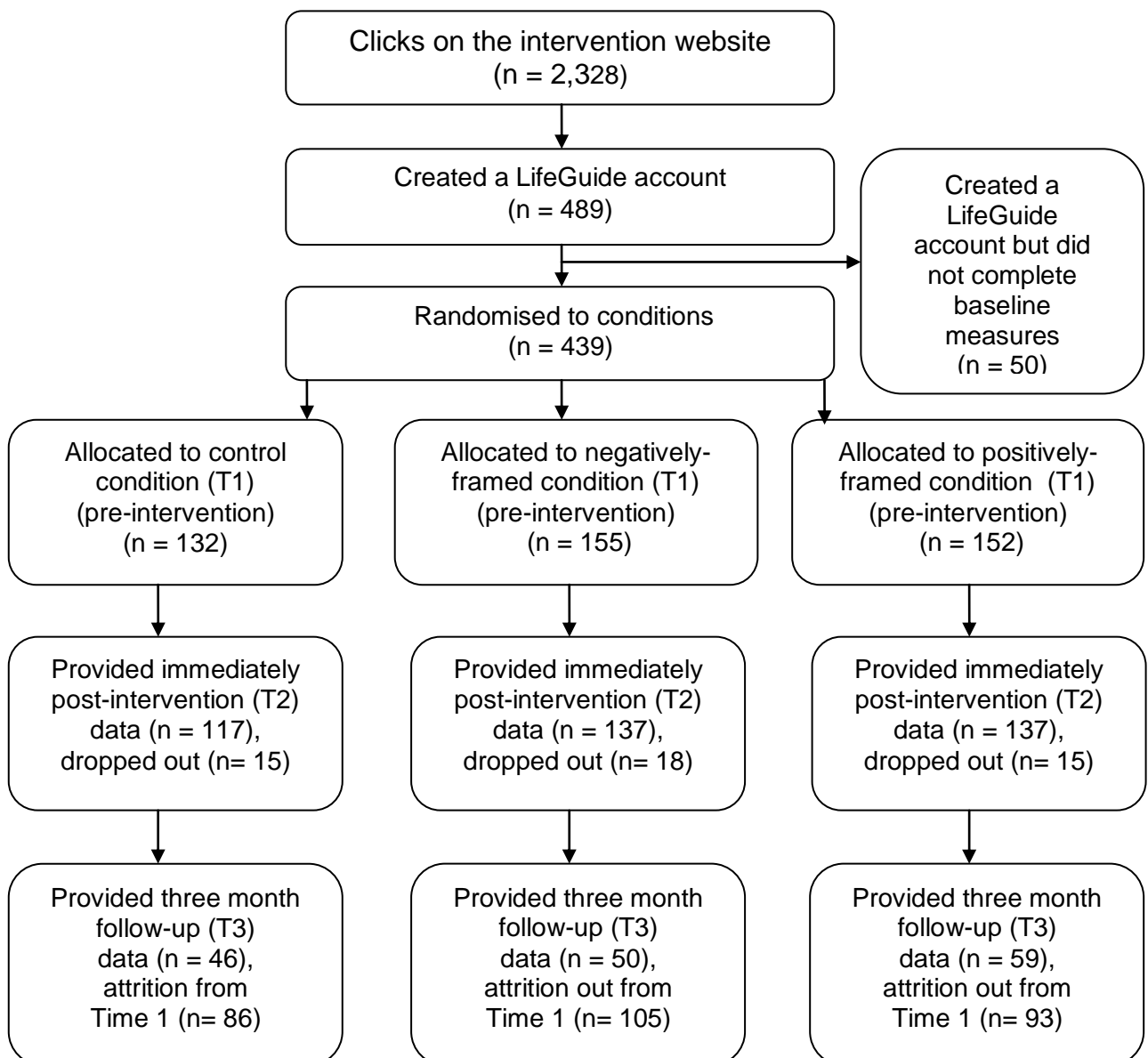


Table 4.1: Demographic comparisons of T1, T2 and T3 completers

Demographic		T1 (n=439)	T2 (n=391)	T3 (n=155)
Age	Mean	30.80 years	31.30 years	32.59 years
	SD	12.75 years	12.70 years	12.66 years
Gender	Female (%)	310 (70.6)	280 (71.6)	114 (73.5)
	Male (%)	129 (29.4)	111 (28.4)	41 (26.5)
Education	Degree level (%)	352 (80.2)	315 (80.6)	132 (85.2)
	Below degree (%)	87 (19.8)	76 (19.4)	23 (14.8)
Ethnicity	Caucasian (%)	375 (85.4)	336 (85.9)	136 (87.7)
	Non- Caucasian (%)	64 (14.6)	55 (14.1)	19 (12.3)
Sexual Orientation	Heterosexual (%)	400 (91.1)	360 (92.1)	147 (94.8)
	Gay male (%)	13 (3.0)	10 (2.6)	2 (1.3)
	Lesbian (%)	3 (0.7)	3 (0.7)	1 (0.6)
	Bisexual (%)	23 (5.2)	18 (4.6)	5 (3.3)
Relationship status	In a relationship (%)	306 (69.7)	274 (70.1)	113 (72.9)
	Not in a relationship (%)	133 (30.3)	117 (29.9)	42 (27.1)
Religiosity	No religious beliefs (%)	232 (52.8)	205 (52.4)	81 (52.3)
	Practicing religion (%)	68 (15.5)	61 (15.6)	26 (16.7)
	Not practicing religion (%)	139 (31.7)	125 (32.0)	48 (31.0)
Sexual Experience	Virgin (%)	20 (4.6)	17 (4.4)	6 (3.9)
	Non-Virgin (%)	419 (95.4)	374 (95.6)	149 (96.1)

4.2.4 Intervention materials

The intervention was built using the LifeGuide authoring tool and hosted on the LifeGuide website.

Control group

Control intervention material developed by Armitage and Talibudeen (2010), providing a brief history of the condom from 1220BC to the 1990s was used (Appendix 9: Screen shots of intervention and control groups). Armitage and Talibudeen's (2010) control material was shortened so that it was similar in

length to the intervention material (170 words). It was designed to not provide information that would potentially change the TPB constructs being measured or behaviour. Participants were presented with this information immediately post T1 measures.

Intervention groups

The condom-related behaviours and beliefs to target (affective attitudes and MN) were identified in chapter 3. In order to target these beliefs, two conditions, using a positively-framed and a negatively-framed message were created based on recommendations by Blanton et al. (2001). In both intervention conditions the first line of the intervention read “condoms come in three ‘types’, the male and female condoms which are used for penetrative sex and the dental dam used for oral sex.” Pictures of these three condoms were provided, along with an interactive online element. When participants hovered over the pictures more information about each of these condoms was provided, such as “the female condom is used for penetrative intercourse. It is a loose-fitting polyurethane sheath closed at one end that is inserted intravaginally before sexual intercourse. It is also called a femidom.”

Both conditions then had three paragraphs of information, one for each condom-related behaviour; *carrying*, *negotiating* and *using* respectively. Each paragraph contained a persuasive message designed to change affective attitudes and MN beliefs. However, the way these messages were framed depended on the intervention condition. In both conditions the opening line pertaining to the condom-related behaviour in question stated what the behaviour entailed, for example, “negotiating with a partner to use a condom may be done verbally (e.g. do you have a condom) or non-verbally (e.g. getting a condom out). It is important to show you want to have safer sex.” The differences in the interventions were how the affective messages were framed shown in Table 4.2 (page 161). A statement then followed these affective messages, for example, “you may want to carry condoms”, to target the MN belief (Appendix 9: Screen shots of intervention groups).

Table 4.2: Examples of positively- and negatively-framed messages

Behaviour	Positively-framed	Negatively-framed
Carrying	People who carry condoms are more responsible	People who do not carry condoms are less responsible
Negotiating	People who negotiate safer sex are more trustworthy	People who do not negotiate safer sex are less trustworthy
Using	People who use condoms are more safe	People who do not use condoms are less safe

Both intervention conditions were the same in terms of layout, whereby positioning of the pictures of the three ‘types’ of condom were kept the same, and the same font was used. The same layout for the three paragraphs of the persuasive messages for each condom-related behaviour was used. The differences between condition were the wording of the affective messages (positive or negative), and word count (negatively-framed condition = 192 words, positively-framed condition = 185 words) (Appendix 9: Screen shots of intervention and control groups).

4.2.5 Measures

Demographics

At T1 the following demographic information was collected; gender, age, ethnicity, education level, religious beliefs, sexual orientation, relationship status and sexual experience. At T3 relationship status and sexual experience information was gathered a second time, as these are demographics which are most likely to change in the intervening time period (Bolton, McKay and Schneider 2010).

TPB measures

The psychological constructs identified as targets for intervention were measured using items from the ACNUD scale used in the cross-sectional study reported in chapter 3. At T1 (pre-intervention), T2 (immediately post-intervention), and T3 (3-month follow-up) three items measured the affective beliefs, MN beliefs, intention, directly-measured attitude, directly-measured SN

and directly-measured PBC, one item for each of the three condom-related behaviours. All responses were rated on 7-point Likert scales with scale anchors 1 measuring an unfavourable response (e.g., *strongly disagree*), and 7 measuring a favourable response (e.g., *strongly agree*) (Appendix 8: Copy of measures). Ajzen (2006b) recommends exploring temporal stability using test-retest reliability between repeated TPB measures. Ajzen (2006b:8) argues that “if measures of the theory’s constructs lack temporal stability, they cannot be expected to predict later behaviour.” Spearman’s correlation coefficient showed good test-retest reliability for the TPB measures in this sample between T1-T2, but more mixed reliability between T2-T3 and T1-T3 as would be expected over time (Table 4.3).

Table 4.3: Test-retest reliability of measures of the TPB constructs

TPB construct	Behaviour	T1-T2	T2-T3	T1-T3
Affective Attitude	Carrying	.77	.49	.48
	Negotiating	.73	.39	.41
	Using	.76	.53	.53
Moral Norm	Carrying	.75	.61	.55
	Negotiating	.66	.55	.45
	Using	.78	.76	.69
Intention	Carrying	.80	.65	.63
	Negotiating	.72	.56	.51
	Using	.78	.70	.69
Directly-measured Attitude	Carrying	.79	.65	.64
	Negotiating	.69	.61	.56
	Using	.77	.72	.63
Directly-measured SN	Carrying	.72	.52	.51
	Negotiating	.71	.54	.57
	Using	.76	.53	.53
Directly-measured PBC	Carrying	.59	.39	.35
	Negotiating	.63	.44	.44
	Using	.67	.49	.47

Measures of self-reported condom-related behaviours

Self-reported measures of *carrying*, *negotiating* and *using* behaviours in the previous month were taken pre-intervention (T1), and 3-month follow-up (T3). To ensure participants understood the condom-related behaviours, definitions were provided. For example, “carrying condoms means the ability to physically access condoms (or femidoms or dental dams). This means you may carry these in your wallet/handbag or prefer not to physically carry them but keep some in a safe place at home.” Two items measured each condom-related behaviour, (e.g., ‘How often in the past month have you used condoms?’ and ‘How often in the past month have you been in the situation where condom use was required?’), with scale anchors 1 (*never*) and 7 (*every day*). Cronbach’s alphas for the measures of the three condom-related behaviours are shown in Table 4.4.

Table 4.4: Cronbach’s alpha of T1 and T3 behaviour measures

Behaviour	T1	T3
Carrying	0.63	0.74
Negotiating	0.67	0.87
Using	0.84	0.92

Message acceptability

A message acceptability measure, similar to that used by Armitage and Talibudeen (2010), which has been shown to have good internal reliability $\alpha = .78$ was used in this study. Participants were presented with the following questions immediately post-intervention (T2): “what did you think about the information you just read? Did you think it was...?”. Responses were measured on five 7-point semantic differential scales anchored; 1 (*not at all interesting*) and 7 (*very interesting*), 1 (*not at all memorable*) and 7 (*very memorable*), 1 (*not at all persuasive*) and 7 (*very persuasive*), 1 (*not at all helpful*) and 7 (*very helpful*), and 1 (*not at all accurate*) to 7 (*very accurate*) (Appendix 8: Copy of measures). In this sample, internal reliability was high $\alpha = .94$.

Item presentation

Similar to the other studies in this thesis reported in chapters 2 and 3, the order of item presentation for each TPB construct was the same for each participant. However, unlike previous studies reported in this thesis, the items for each of the condom-related behaviours were not set to randomly appear as there were fewer items for participants to respond to, which meant response fatigue was less likely than in other studies. The order of the TPB item presentation for each data collection point is shown in Table 4.5. At each time point participants were required to respond to eight questions, which each had three sub-questions, one for each of the three condom-related behaviours. Therefore, participants answered 24 questions at each data collection point.

Table 4.5: Item presentation order of the TPB constructs

Measure	T1 Item number	T2 Item number	T3 Item number
Message Acceptability 1	N/A	1	N/A
Intention	1	2	1
Affect	2	3	2
Moral Norm	3	5	3
Behaviour	4	N/A	4
Directly-measured Attitude	5	4	5
Behaviour Situation	6	N/A	6
Directly-measured SN	7	6	7
Message Acceptability 1	N/A	7	N/A
Directly-measured PBC	8	8	8

Note: N/A signifies that the item was not measured at the data collection point

4.2.6 Procedure

Piloting of intervention prior to main data collection

Once the intervention had been built using the LifeGuide authoring tool, the intervention link was sent to five individuals not involved in the study for piloting purposes. This piloting was to; a) ensure that the logic linking the pages of the intervention worked, b) ensure that individuals were randomised to different intervention conditions, and c) check the automated email with the link to

complete the second part of the study worked. To test the automated email function with the intervention link, the email reminder was set to email the link five minutes after completing the post-intervention measures. Following piloting, minor changes such as re-formatting some of the TPB questions so that they were set to require an answer, were made to the intervention using the LifeGuide authoring tool before the main study was launched.

Main intervention study procedure

Ethical approval was obtained from the Faculty of Health and Life Sciences at Coventry University before data collection commenced (Appendix 10: Ethical approval). Recruitment took place over three calendar months. Links to the questionnaire were put on six websites targeting a range of population sub-samples;

- Facebook (www.facebook.com)
- SONA (<http://coventry.sona-systems.com>)
- SASH (www.healthinterventions.co.uk)
- Twitter (<https://twitter.com>)
- www.onlinepsychresearch.co.uk
- MOODLE (<http://students.coventry.ac.uk>)

Links were also emailed to individuals who had expressed an interest in participating in this study from participation in previous studies reported in this thesis. The Psychology Postgraduate Affairs Group (PsyPAG), a national organisation for psychology postgraduates based at UK institutions were emailed requesting participants. In an attempt to recruit a sample of younger individuals', the PSHE (Personal, Social, and Health Education) leads of 20 schools representing a range of social demographics were written to care of the head teachers asking if they would be interesting in participating in the study. Three schools were interested in the study but could not commit to participating in the timescale required of the researcher. Similarly, 20 older people's forums listed on the Age UK website (www.ageuk.org.uk/get-involved/older-peoples-

forums) were contacted. Of these forums, three agreed to email the link to their members.

When individuals interested in participating in the research clicked on the intervention link they were directed to the intervention on the LifeGuide website, hosted on a secure server by the University of Southampton. The intervention website consisted of five pages to keep succinctness (Pequegnat et al. 2007). Once participants clicked on the intervention link they were required to enter their email address and create a unique personal identifier to ensure that; 1) data could be withdrawn if requested, and 2) LifeGuide could send an automated email in 3-months time to collect T3 data. Once registered with LifeGuide, participants were directed through the participant information sheet and consent form, followed by the pre-intervention questionnaire containing the demographic measures. After completing pre-intervention measures, participants were randomly assigned to one of three intervention conditions automatically by the LifeGuide software. Participants then read the intervention materials, completed a post-intervention questionnaire, and were then given a thank you and interim debrief sheet (Appendix 8: Copy of measures and embedded participant information sheet, consent form and debriefs). When participants received the email to complete the second part of the study (3-months later), they were invited to log on to the intervention with their unique ID and email address. If participants had forgotten their log-in details LifeGuide was able to re-set their credentials. Participants then completed the T3 measures, and were presented with a more detailed study debrief.

4.2.7 Data Analysis

A series of exploratory and main analyses were conducted on the intervention data.

Exploratory analysis

MANOVA and chi-square analyses were used to perform randomisation checks to determine whether baseline measures or demographic variables differed by intervention condition (section 4.3.1, page 167).

Main analyses

For the main analyses, intention-to-treat (ITT) analysis was used as Elliott and Armitage (2009, p. 113) argue that “the vast majority of previous TPB-intervention studies may have overestimated intervention effects” because ITT analysis was not used. ITT analysis reduces bias that may be introduced through attrition (Tabachnick & Fidell, 1996). “Drop-outs” data are included in the final sample by using the last observation carried forward method (LOCF) (Shao & Zhong, 2003), in essence treating the “drop-outs” as “no changers.” The rationale for applying ITT analyses to the intervention data was due to the high attrition rate from post-intervention to 3-month follow-up (Hagger, Lonsdale and Chatzisarantis 2012). In order to test each of the hypotheses (section 4.1.5, page 156), a series of ANOVAs and MANOVAs were performed using the ITT LOCF method. Each of these analyses will be described in more detail in the following sections.

4.3 Results

Exploratory analyses

4.3.1 Randomisation check

A MANOVA with intervention condition as the independent variable and age, pre-intervention TPB measures (T1; affect x 3, MN x 3, attitude x 3, SN x 3, PBC x 3 = 18 measures) and behaviour (x 3; CNU) as the dependent variables was performed to ensure that randomisation had been successful. The MANOVA suggested that there were no significant differences between conditions at baseline (T1), $F(44,826) = .72$, $p = .91$, $\eta_p^2 = .04$. Chi-square tests were used to determine whether the nominally measured demographics were evenly distributed across the intervention conditions. Analyses suggested that there were equivalent numbers of males and females ($\chi^2(2) = 1.94$, $p = .38$), ethnic backgrounds ($\chi^2(2) = 1.28$, $p = .53$), individuals of different sexual orientations ($\chi^2(2) = 1.60$, $p = .45$), religious and non-religious individuals ($\chi^2(2) = 5.19$, $p = .08$), and sexual experience ($\chi^2(2) = 2.28$, $p = .32$), in the three conditions. However, a larger proportion of individuals educated below degree level ($\chi^2(2) = 10.13$, $p = .01$), were allocated to the negatively-framed message

condition. Similarly a larger proportion of individuals in a relationship ($\chi^2(2) = 8.38, p = .02$), were allocated to the positively-framed message condition.

Main analyses

4.3.2 MANOVA ITT analysis to determine effect of intervention on behaviour

In order to test the first hypothesis, where it was expected that negatively-framed persuasive messages will increase self-reported performance of condom-related behaviours more effectively than positively-framed or control messages, a 2 (time: T1/T3) x 3 (intervention condition: control, positively-, or negatively-framed) MANOVA was performed on the dependent variables of self-reported condom-related behaviours (*carrying, negotiating and using*) using a ITT LOCF method. Table 4.6 (page 169) shows the mean self-reported behaviour.

Findings suggested there was no main effect of condition, Wilks' $\Lambda = .99, F(6, 866) = .79, p = .58, \eta_p^2 = .005$, time, $\Lambda = .99, F(3, 433) = 1.28, p = .28, \eta_p^2 = .009$, and no time by condition interaction effect, $\Lambda = .99, F(6, 866) = .82, p = .55, \eta_p^2 = .006$.

Table 4.6: Means \pm standard deviations for participants' scores on TPB measures across all three intervention time points by intervention condition

Measure	Condom Behaviour	Control group			Negatively-frame message group			Positively-frame message group		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
Affect	Carrying	4.59 \pm 1.99	4.65 \pm 2.06	4.67 \pm 1.95	4.51 \pm 1.91	4.40 \pm 2.07	4.74 \pm 1.92	4.74 \pm 2.04	4.72 \pm 2.10	4.74 \pm 1.98
	Negotiating	4.42 \pm 2.07	4.61 \pm 2.14	4.54 \pm 1.98	4.40 \pm 1.85	4.33 \pm 2.04	4.66 \pm 1.82	4.53 \pm 1.95	4.59 \pm 2.08	4.52 \pm 1.96
	Using *	4.83 \pm 2.12	5.18 \pm 2.10	5.27 \pm 1.85	5.22 \pm 1.74	5.03 \pm 1.96	5.35 \pm 1.72	5.32 \pm 1.93	5.20 \pm 2.06	5.45 \pm 1.80
Moral Norm	Carrying	4.17 \pm 2.29	4.05 \pm 2.33	4.34 \pm 2.19	4.03 \pm 2.15	4.25 \pm 2.03	4.14 \pm 2.16	4.28 \pm 2.22	4.30 \pm 2.32	4.18 \pm 2.26
	Negotiating	4.58 \pm 2.31	4.41 \pm 2.36	4.61 \pm 2.24	4.49 \pm 2.24	4.71 \pm 2.14	4.62 \pm 2.24	4.63 \pm 2.26	4.66 \pm 2.31	4.59 \pm 2.25
	Using	4.97 \pm 2.33	4.85 \pm 2.32	5.14 \pm 2.19	4.72 \pm 2.17	4.81 \pm 2.11	4.69 \pm 2.17	4.95 \pm 2.23	4.81 \pm 2.32	4.84 \pm 2.69
Directly-measured Attitude	Carrying *	5.17 \pm 1.94	5.04 \pm 2.02	5.17 \pm 1.90	5.16 \pm 1.75	4.81 \pm 1.83	5.16 \pm 1.69	5.11 \pm 1.82	5.00 \pm 1.88	5.05 \pm 1.79
	Negotiating	5.18 \pm 1.88	5.23 \pm 1.88	5.20 \pm 1.81	5.34 \pm 1.76	5.05 \pm 1.81	5.39 \pm 1.76	5.37 \pm 1.65	5.28 \pm 1.68	5.28 \pm 1.64
	Using *	5.67 \pm 1.64	5.59 \pm 1.67	5.70 \pm 1.64	5.44 \pm 1.76	5.19 \pm 1.86	5.49 \pm 1.69	5.59 \pm 1.66	5.37 \pm 1.78	5.46 \pm 1.65
Directly-measured SN	Carrying *	2.51 \pm 1.63	2.80 \pm 1.79	2.87 \pm 1.78	2.75 \pm 1.66	2.95 \pm 1.74	2.85 \pm 1.72	2.41 \pm 1.78	2.75 \pm 1.96	2.40 \pm 1.78
	Negotiating *	2.80 \pm 1.82	3.05 \pm 1.96	3.11 \pm 1.94	2.96 \pm 1.72	3.05 \pm 1.72	3.10 \pm 1.83	2.72 \pm 1.88	2.95 \pm 1.96	2.79 \pm 1.92
	Using	3.06 \pm 1.96	3.16 \pm 2.06	3.30 \pm 2.00	3.11 \pm 1.75	3.18 \pm 1.84	3.22 \pm 1.82	2.93 \pm 2.05	3.13 \pm 2.12	2.97 \pm 2.01
Directly-measured PBC	Carrying *	6.18 \pm 1.39	6.19 \pm 1.38	6.37 \pm 1.12	6.16 \pm 1.35	5.83 \pm 1.57	6.16 \pm 1.43	6.36 \pm 1.27	6.21 \pm 1.53	6.37 \pm 1.29
	Negotiating	6.03 \pm 1.47	5.99 \pm 1.50	6.11 \pm 1.38	5.73 \pm 1.66	5.73 \pm 1.62	5.79 \pm 1.54	6.00 \pm 1.58	5.90 \pm 1.82	5.98 \pm 1.62
	Using	5.81 \pm 1.67	6.00 \pm 1.49	5.98 \pm 1.54	5.48 \pm 1.85	5.69 \pm 1.68	5.59 \pm 1.77	5.84 \pm 1.78	5.78 \pm 1.96	5.84 \pm 1.77
Intention	Carrying *	3.79 \pm 2.34	4.10 \pm 2.38	4.04 \pm 2.22	3.57 \pm 2.21	3.97 \pm 2.17	3.80 \pm 2.22	3.89 \pm 2.41	4.16 \pm 2.25	3.80 \pm 2.36
	Negotiating	4.06 \pm 2.46	4.10 \pm 2.47	4.11 \pm 2.38	3.96 \pm 2.32	4.32 \pm 2.28	4.19 \pm 2.27	4.00 \pm 2.33	4.18 \pm 2.36	3.95 \pm 2.32
	Using *	3.87 \pm 2.44	4.24 \pm 2.45	4.06 \pm 2.39	3.83 \pm 2.23	4.29 \pm 2.24	4.08 \pm 2.29	3.84 \pm 2.39	4.08 \pm 2.42	4.01 \pm 2.34
Behaviour	Carrying	1.82 \pm 1.38	N/A	1.85 \pm 1.40	1.72 \pm 1.25	N/A	1.82 \pm 1.40	1.76 \pm 1.34	N/A	1.78 \pm 1.39
	Negotiating	1.52 \pm .89	N/A	1.50 \pm .84	1.59 \pm .99	N/A	1.62 \pm 1.06	1.65 \pm 1.13	N/A	1.68 \pm 1.25
	Using	1.97 \pm 1.43	N/A	1.91 \pm 1.35	1.91 \pm 1.47	N/A	1.94 \pm 1.45	2.00 \pm 1.53	N/A	2.04 \pm 1.62

Note: N/A signifies that the item was not measured at the data collection point. Asterisks represent univariate test of difference for the TPB construct.

4.3.3 MANOVA ITT analysis to determine effect of intervention on TPB constructs

Table 4.6 (page 169) shows the mean and SD scores on the measured TPB constructs by intervention condition for each condom-related behaviour. In order to test the second hypothesis, where it was expected that negatively-framed persuasive messages will strengthen the constructs from an extended TPB framework more effectively than positively-framed or control messages with respect to the condom-related behaviours, a 3 (time: T1/T2/T3) x 3 (intervention condition: control, positively-, or negatively-framed) MANOVA was conducted on the six measured TPB constructs (intention, affect, MN, attitude, SN and PBC). To clarify, there were six measured TPB constructs for each of the condom-related behaviours, so in total, 18 TPB constructs were entered into the MANOVA. Using Wilks' Lambda statistic (Λ), findings suggested there was a main effect of time ($\Lambda = .74$, $F(36, 400) = 3.92$, $p = .0001$, $\eta_p^2 = .26$). But no main effect of condition ($\Lambda = .94$, $F(36, 836) = .70$, $p = .91$, $\eta_p^2 = .03$), and no interaction of time by condition ($\Lambda = .81$, $F(72, 800) = .82$, $p = .08$, $\eta_p^2 = .10$).

Univariate follow-up tests showed a main effect of time for *carrying* intention ($F(2, 870) = 11.91$, $p = .0001$, $\eta_p^2 = .03$), *using* intention ($F(2, 870) = 13.54$, $p = .0001$, $\eta_p^2 = .03$), *using* affect, ($F(2, 870) = 7.17$, $p = .001$, $\eta_p^2 = .02$), *carrying* attitude ($F(2, 870) = 8.66$, $p = .0001$, $\eta_p^2 = .02$), *using* attitude ($F(2, 870) = 7.83$, $p = .001$, $\eta_p^2 = .02$), *carrying* SN ($F(2, 870) = 10.34$, $p = .0001$, $\eta_p^2 = .02$), *negotiating* SN ($F(2, 870) = 5.60$, $p = .006$, $\eta_p^2 = .02$), and *carrying* PBC ($F(2, 870) = 7.71$, $p = .0001$, $\eta_p^2 = .02$). Table 4.7 (page 171) shows the pairwise comparisons of where the changes in TPB constructs occurred. These results suggest that participating in the intervention regardless of condition significantly increased intention to *carry* and *use* condoms, improved attitudes toward *carrying* and *using* condoms, SN toward *carrying* and *negotiating* condom use, PBC toward *carrying* condoms, and increased the belief that *using* condoms would make an individual feel safe.

Table 4.7: Significant (p) values for pairwise comparisons of TPB constructs contributing to the main effect of time for condom-related behaviours

Behaviour	TPB construct	T1-T2	T2-T3	T1-T3
Carrying	Intention	<.001	.03	.06
	Directly-measured attitude	.001	.01	1.00
	Directly-measured SN	<.001	.01	.23
	Directly-measured PBC	.04	.01	.39
Negotiating	Directly-measured SN	.01	1.00	.01
Using	Intention	<.001	.16	.001
	Affective attitude	.01	.01	1.00
	Directly-measured attitude	.01	.02	1.00

Note: All effects signify significant increases in the TPB constructs

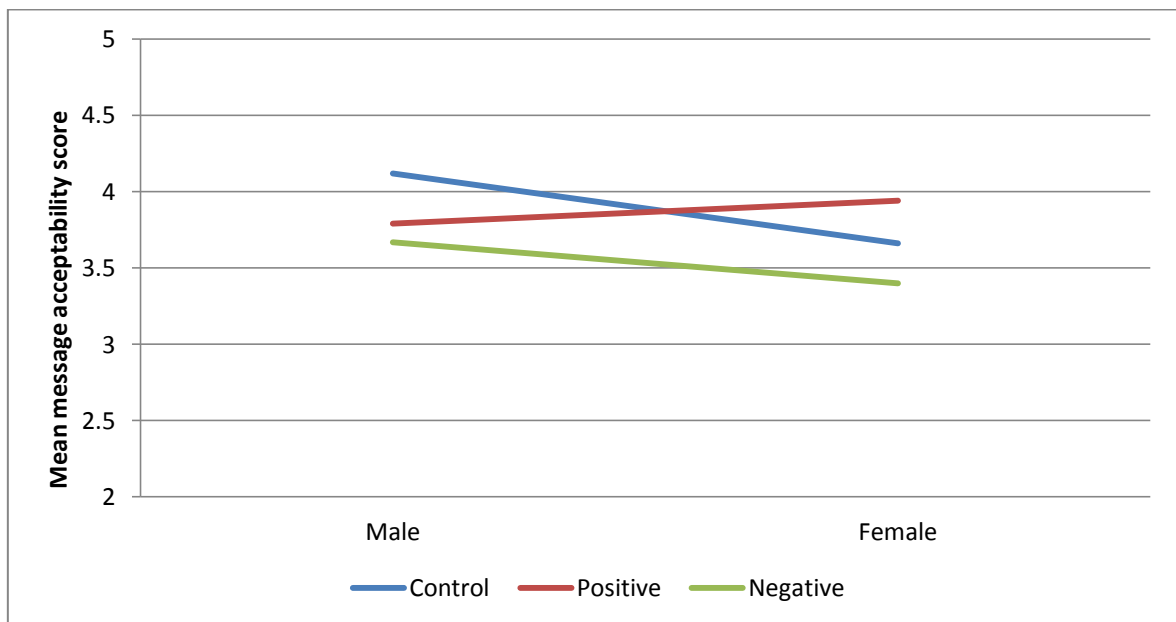
4.3.4 ANOVA analysis to explore message acceptability

In order to test the third hypothesis, where it was expected that message acceptability was likely to differ depending on the message read, an ANOVA, with intervention condition as the independent factor was performed. Results suggested that there was no difference between the three intervention groups on the acceptability of the message they were presented with, $F(2,388) = .36$, $p = .70$. The control, negatively- and positively-framed message group means were all close to the scale mid-point, 3.79, 3.90 and 3.91, respectively.

Macdonald et al. (2007) argue that persuasive messages need to be acceptable to the target population, therefore three further ANOVAs were carried out to explore possible age, gender and relationship status effects on message acceptability. The first ANOVA, with age group (≤ 39 or ≥ 40) and intervention condition as the between-subjects factors, suggested that there was a difference between age groups on message acceptability ($F(1,383) = 10.91$, $p = .001$). But this did not differ between intervention conditions ($F(2,383) = .09$, $p = .92$), and no interaction between age group and intervention condition was present, ($F(2,383) = .41$, $p = .62$). Examination of the mean scores suggested that older individuals rated the messages as more acceptable than younger individuals ($M = 4.29$ versus 3.77, respectively).

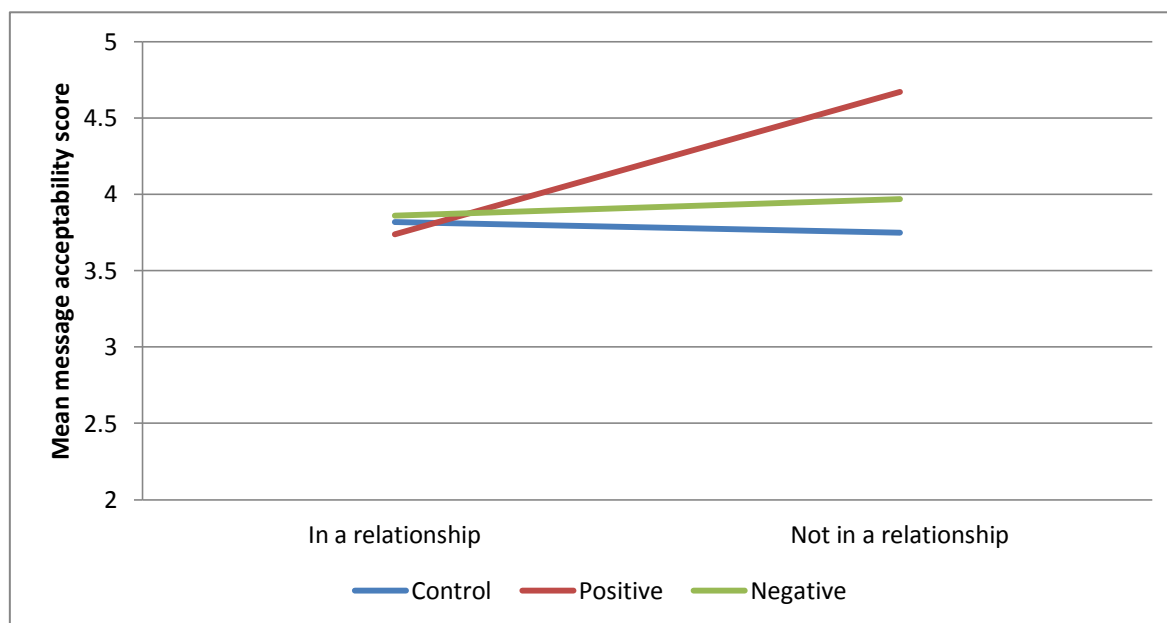
Univariate analysis exploring gender differences toward message acceptability suggested that there was no difference between genders ($F(1,383) = .001, p = .98$), or intervention conditions ($F(2,383) = .06, p = .94$). But there was an interaction between gender and intervention condition, $F(2,383) = 3.30, p = .04$. Figure 5.2 suggests that males viewed the control and negatively-framed messages as more acceptable than females, whereas for the positively-framed message the opposite was true. Therefore, these results suggest that males preferred negatively-framed and historical messages than females.

Figure 4.2: Interaction between mean message acceptability score, gender and intervention condition



Univariate analysis exploring message acceptability between individuals currently in and not in a relationship suggested that there was a difference between relationship status ($F(1,383) = 3.88, p = .05$), but no difference between intervention conditions ($F(2,383) = 1.99, p = .14$). An interaction was present between relationship status and intervention condition, $F(2,383) = 3.30, p = .04$. Figure 4.3 (page 162) suggests that individuals not in a relationship viewed the positively-framed messages as more acceptable than individuals in a relationship. Therefore, these results suggest that individuals not in a relationship preferred positively-framed to historical or negatively-framed safer sex messages.

Figure 4.3: Interaction between mean message acceptability score, relationship status and intervention condition



4.3.5 MANOVA ITT analysis to determine effect of intervention on behaviour for individuals currently in and not in a relationship

The analysis undertaken in sections 4.3.2 and 4.3.3 (pages 168 and 170) found that performance of condom-related behaviours did not increase from participating in the intervention study, but some of the indirectly- and directly-measured constructs of the TPB were strengthened towards condom-related behaviours (e.g., *carrying* intention, SN and PBC) in the whole sample regardless of intervention condition. In section 4.3.4 (page 171), it was found that message acceptability did not differ between the three conditions, but there were some demographic differences (e.g., individuals not in a relationship preferred positively-framed messages).

The literature reviewed in chapter 1 (e.g., section 1.2.2, page 12) indicated that consistent performance of condom-related behaviours is often not required for individuals in a relationship. For individuals in a relationship, condom non-use may have been negotiated as heterosexual women may be using a long-acting reversible contraceptive, or for gay individuals the non-use may signify trusting a sexual partner to be monogamous. The lack of change in behaviour in this intervention study may therefore be due to a large proportion of the sample being

in a relationship (Table 4.1, page 159), and warrants exploration of the effects of the intervention on individuals in and not in a relationship. Based on the existing literature, it would be expected that individuals not in a relationship will self-report performing condom-related behaviours more than individuals in a relationship. To test this expectation, a 2 (time: T1/T3) x 2 (relationship status: in a relationship/not in a relationship) x 3 (intervention condition: control, positively-, or negatively-framed) MANOVA was performed on the dependent variables of self-reported condom-related behaviours (*carrying*, *negotiating* and *using*) using a ITT LOCF method. Table 4.8 shows the mean self-reported behaviour by relationship status and intervention condition.

Table 4.8: Means \pm standard deviations for participants' self-reported performance of condom-related behaviours at T1 and T3 by relationship status and intervention condition

Behaviour	Condition	In a relationship (n = 305)		Not in a relationship (n = 133)	
		T1	T3	T1	T3
Carrying	Control	1.87 \pm 1.82	1.89 \pm 1.79	2.55 \pm 2.18	2.64 \pm 2.28
	Negative	1.66 \pm 1.52	1.72 \pm 1.59	2.52 \pm 2.16	2.77 \pm 2.32
	Positive	1.83 \pm 1.66	1.97 \pm 1.64	2.76 \pm 2.54	2.79 \pm 2.58
Negotiating	Control	1.74 \pm 1.33	1.69 \pm 1.30	1.45 \pm 0.88	1.48 \pm 0.90
	Negative	1.83 \pm 1.56	1.78 \pm 1.49	1.62 \pm 0.95	1.71 \pm 1.09
	Positive	1.75 \pm 1.34	1.75 \pm 1.47	2.48 \pm 2.24	2.45 \pm 2.20
Using	Control	2.18 \pm 1.60	2.24 \pm 1.62	1.73 \pm 1.42	1.55 \pm 1.27
	Negative	2.08 \pm 1.87	2.08 \pm 1.79	1.98 \pm 1.48	2.07 \pm 1.56
	Positive	2.11 \pm 1.71	2.13 \pm 1.86	2.39 \pm 1.98	2.45 \pm 2.02

Results suggested there was no main effect of condition, Wilks' $\Lambda = .98$, $F(6, 860) = 1.78$, $p = .10$, $\eta_p^2 = .01$, or time, $\Lambda = .99$, $F(3, 430) = .97$, $p = .41$, $\eta_p^2 = .01$. But there but there was a main effect of relationship status, $\Lambda = .93$, $F(3, 430) = 10.67$, $p = .001$, $\eta_p^2 = .07$. No interaction effects were found between time x condition, $\Lambda = .99$, $F(6, 860) = .85$, $p = .53$, $\eta_p^2 = .01$, time x relationship status, $\Lambda = .99$, $F(3, 430) = 1.24$, $p = .29$, $\eta_p^2 = .01$, or time x condition x relationship status, $\Lambda = .98$,

$F(6, 860) = 1.12, p = .35, \eta_p^2 = .01$. However, the interaction effect of relationship status x condition approached significance, $\Lambda = .97, F(6, 860) = 2.05, p = .06, \eta_p^2 = .01$. Univariate follow-up tests revealed a significant effect for *carrying* behaviour between individuals in and not in a relationship, $F(1, 432) = 20.11, p = .001, \eta_p^2 = .04$. Examination of the means suggested that individuals not in a relationship report more *carrying* behaviour at T1 and T3 than individuals in a relationship. For the condition x relationship interaction which approached significance, a difference was found for *negotiating* behaviour, $F(2, 432) = 4.15, p = .02, \eta_p^2 = .02$. Examination of the means suggested that individuals not in a relationship and randomised to the negatively-framed message condition, had a larger positive change (i.e. increase) in *negotiating* behaviour at T3 than those assigned to either the positively-framed or control condition. These analyses were re-run on the sample of individuals who completed both the T1 and T3 measures (i.e. not LOCF method; in a relationship $n = 112$, not in a relationship $n = 43$). The findings of relationship status were replicated; however, the relationship x condition interaction no longer approached significance.

4.3.6 MANOVA analysis to determine the effects of time spent reading intervention materials

The intervention had been designed to be brief similar to the ‘Sex. Worth Talking About’ Campaign [SWTA] (DoH 2011a; section 1.1, page 1). To explore whether the time spent reading the message contributed to the increases found in the analysis in section 4.3.3 (page 170) one further MANOVA analysis was undertaken splitting the group by mean time spent reading the intervention materials. The mean time that individuals spent reading the intervention materials was 46.14 seconds (SD = 2.96). Therefore, using a mean split, individuals were sub-divided into those who spent shorter (≤ 46 second and under) and longer (≥ 47 seconds and over) amounts of time reading the intervention materials. This split meant that 64.0% ($n = 281$) were allocated to the shorter group, and 36.0% ($n = 158$) allocated to the longer group. A 2 (time spent reading: shorter/longer) x 6 (TPB construct: intention/affect/MN/attitude/SN/PBC) MANOVA was undertaken to explore whether time spent reading the persuasive message affected changes in TPB constructs.

Results suggested that time spent reading the intervention material did not have an effect on any of the observed increases found in the analysis in section 4.3.3 (page 170), Wilks' $\Lambda = .96$, $F(18,420) = 1.09$, $p = .36$, $\eta_p^2 = .04$. Therefore, these results suggest that reading a brief message for less than 45 seconds can have an effect on changing TPB constructs toward performing condom-related behaviours.

4.4 Discussion

The present study reports an intervention aimed at increasing intentions to perform, and performance of three condom-related behaviours in a broad population sample, using persuasive messages based on psychological constructs of an extended TPB. Delivery and evaluation of an intervention based on prior qualitative and quantitative studies, which were reported in chapters 2 and 3 of this thesis is the third and final phase intervention development using the TPB (Ajzen 2006a; Sutton 2002). Exploration of the impact of a randomised controlled intervention is crucial for development of future interventions (Armitage and Talibudeen 2010; Cabinet Office Behavioural Insights Team 2010; Craig et al. 2008). In the existing literature there are evaluations of TPB-based safer sex interventions which are targeted at specific populations and condom-related behaviours (e.g., Armitage and Talibudeen 2010; Bryan, Aiken and West 1997; Hill and Abraham 2008). This is the first study, however, that aimed to evaluate an online intervention targeting multiple condom-related behaviours in a broad population. Although findings from this intervention study were mixed, this study has contributed to the literature on the efficacy of public health safer sex interventions using the TPB as a theory to inform the intervention targets.

Three hypotheses were tested in the current study (section 4.1.5, page 156). Findings from each of the hypothesis tested will be discussed in detail as follows. Exploration of the lack of change in self-reported behaviour will be discussed in section 4.4.1 (page 177). The null effect of message framing on targeted psychological constructs will be discussed in section 4.4.2 (page 179). Findings concerning message acceptability in relation to the existing literature and future safer sex persuasive messages will be discussed in section 4.4.3 (page 184). In addition to the hypotheses tested, the implications of the effects of reading a brief message will be discussed in section 4.4.4 (page 186). The use of LifeGuide to

deliver safer sex interventions will be discussed in section 4.4.5 (page 186), and the promotion of condom-related behaviours in a broad population will be discussed in section 4.4.6 (page 187).

4.4.1 Exploring the lack of change in self-reported behaviour

The intervention did not have an effect on behaviour as measured by self-reports of condom-related behaviours. One reason for this null effect may have been the delay between participating in the intervention study and subsequent measurement of behaviour. The time delay between participating in interventions studies and subsequent measurement of behaviour to determine the effect of intervention has been extensively debated in the literature (Fisher and Fisher 1992; Hardeman, et al. 2002; McEachan et al. 2011; Mize et al. 2002; Sheeran and Orbell 1998). This study opted for a 3-month delay between initial measurement of behaviour and subsequent measurement of behaviour, so that participants would potentially have had the opportunity to initiate behaviour change (Mize et al. 2002). Attrition was high in this study (Figure 4.1, page 158), consistent with other internet delivered safer sex interventions (Pequegnat et al. 2007). Therefore, ITT analysis was used on the data, meaning that it was assumed that behaviour had not changed for those individuals who did not complete T3 measurements (section 4.2.7, page 166). Using ITT analyses meant that the final sample size was sufficient to detect an effect if it were present, as this conservative method defines drop-outs as ‘no changers’. It is worth noting that analysis was also undertaken on just the sample that just completed all three data collection points ($n = 155$). Results from this analysis replicated those of the ITT analysis.

A further explanation for the lack of behaviour change in this intervention study may be due to the high proportion of heterosexuals, and individuals in a relationship in this sample (Table 4.1, page 159). An intervention to prevent HIV and other STIs in couples by Harvey et al. (2009) found that 3-months post-intervention there was no increase in self-reported condom use, but at 6-months self-reported condom use increased. The results from this study are consistent with Harvey et al’s (2009) findings 3-months post-intervention; however, longer-term impacts from participating in this study are unknown. As outlined in the

literature review (section 1.2.2, page 12), for individuals in committed monogamous relationships, particularly heterosexual relationships, condom *use* tends to be as a secondary preventative measure when for example, the female partner is taking the oral contraceptive and on a course of antibiotics for an infection, as antibiotics are known to reduce the effectiveness of oral contraceptives (Faculty of Family Planning and Reproductive Health Care 2005). Therefore, although promoting performance of condom-related behaviours is still required in this population, consistent performance of these condom-related behaviours may be less of a priority for these individuals and partially explain the null findings.

For individuals currently in committed relationships condom-related behaviours are less relevant (Nusbaum and Rosenfeld 2004). However, relationships may fail, and new ones form so it is important to include these individuals in safer sex campaigns (Moreau et al. 2011). Therefore, a second set of analysis on self-reported performance of condom-related behaviours splitting the sample by individuals in and not in a relationship were performed. Findings suggested that individuals not currently in a relationship reported *carrying* condoms more than individuals in a relationship, suggesting they are prepared to practice safer sex if the opportunity arises (Arden and Armitage 2008). Individuals not in a relationship reporting *carrying* behaviour more than those in a relationship may signify that those individuals are more aware of the risks of unsafe sex with new sexual partners (DePadilla et al. 2011; Misovich, Fisher and Fisher 1996; Newby, Wallace and French 2012). To reduce the chance of unsafe sex occurring they plan for future sexual contact (Bryan, Aiken, and West 1997; Vivancos, Abubaker and Hunter 2010), and therefore self-report higher performance of *carrying* condoms. In addition, the interaction between intervention condition and relationship status approached significance. Findings suggested that for *negotiating* behaviour, a negatively-framed message may be more effective at increasing this behaviour for individuals not in a relationship. This tentative finding contributes to the literature which argues that negatively-framed messages are more likely to increase condom *use* behaviour, as individuals do not want to be associated with the negatively-framed individual portrayed in the message (Blanton et al. 2001; Block and Keller 1995).

These findings suggest that behaviour is difficult to change in the short-term in a broad population. Due to the high proportion of the sample in the current study being heterosexual and in a relationship, self-reported performance of condom-related behaviours was low at the outset. Clearly, longer-term follow-up is required to determine the impact of participating in an intervention on self-reported performance of condom-related behaviours when the situation may be required (Faculty of Family Planning and Reproductive Health Care 2005; see also section 1.2.2, page 12). Evaluation of the long-term effects of a brief safer sex intervention is important for developing future public health campaigns (Cabinet Office Behavioural Insights Team 2010; DoH 2011b; Mausbach et al. 2007).

4.4.2 Exploring the null effect of message framing on targeted psychological constructs

The current study did not find a significant effect for message framing on condom-related behavioural antecedents (intention, attitude, SN, PBC, affect and MN). This finding is consistent with other safer sex studies reporting that an intervention condition(s) works no better than a control (e.g., Brown, Hurst and Arden 2011; Henderson et al. 2007; Sanderson and Jemmott 1996). Block and Keller (1995) argue that for behaviours where an individual knows the outcome of performing health risk behaviour, the framing of a message is less important because an individual needs to process a message less when the outcome is more certain. For example, in terms of *not* performing condom-related behaviours, individuals are likely to be aware of the possible health risk outcomes such as contracting an STI. Despite the null effect of message framing, significant positive changes occurred in some of the measured TPB psychological constructs for condom-related behaviours. Table 4.9 (page 180) shows these increases by condom-related behaviour. Possible explanations for these findings will be discussed further in the following sub-sections.

Table 4.9: Significant increases on measures of extended TPB constructs due to participating in the intervention study by condom-related behaviour

TPB construct	Carrying	Negotiating	Using
Affective attitude	No	No	Yes
Moral Norm	No	No	No
Directly-measured attitude	Yes	No	Yes
Directly-measured SN	Yes	Yes	No
Directly-measured PBC	Yes	No	No
Intention	Yes	No	Yes

Mere measurement effect explaining change in cognitions

One possible explanation for the changes that occurred, regardless of intervention condition, would be a ‘mere measurement’ effect (Godin et al. 2008). Sherman (1980) first demonstrated this effect in a series of studies exploring prediction of socially desirable or undesirable behaviours. Results suggested that merely measuring individuals’ intentions, explained why individuals may subsequently act in accordance with these intentions. Sherman (1980: 220) argued that “the implication is that by having people consider beforehand what their behaviour might be in a situation involving moral behaviour, their actual behaviour in that situation will be more socially desirable, acceptable, and moral than if they had not made initial predictions.” Condom-related behaviours have a strong moral element, as *not* performing these behaviours may lead to a STI for oneself and one’s sexual partner, and for heterosexual couples possible unwanted pregnancies (Stephenson, Imrie and Bonell 2003). Morwit and Fitzsimons (2004) argue that asking about intentions reinforces the accessibility of an individual’s attitude toward the behaviour, which subsequently increases the chance that the behaviour will be performed when required. It is possible that completing the TPB questionnaires on three occasions, compared with reading a brief persuasive message on one occasion may have altered cognitions (Ogden 2003).

To untangle mere measurement effects, French and Sutton (2010: 464) recommend that future interventions adopt a Solomon four-group design to determine the “effect of measurement on the size of an intervention effect”, shown in Table 4.10 (page 181). The difficulty with these designs however, is they require large sample sizes (French and Sutton 2010), and a different approach to the

statistical analysis of the effects of the intervention in the pre- post-test groups compared to the post-test only groups (Walton-Braver and Braver 1988). A recent randomised controlled trial that aimed to retain novice blood donors by Godin et al. (2010) used a Solomon four-group design. Findings suggested that completing a questionnaire about blood donation, had a significant impact on donation behaviour. They found that individuals who did *not* complete a questionnaire were less likely to register for blood donation. These studies suggest that future safer sex internet interventions, with longer recruitment periods, should adopt the Solomon four-group design to further explore the mere measurement effects on condom related-behaviours. As internet interventions are cheaper to deliver than offline interventions this could be feasible in future studies (Griffiths et al. 2006).

Table 4.10: The Solomon (1949) four-group design: Measurement and intervention points

TPB construct	Pre-test	Intervention	Post-test
Group 1	Yes	Yes	Yes
Group 2	Yes	No	Yes
Group 3	No	Yes	Yes
Group 4	No	No	Yes

Novelty of control message explaining change in cognitions

A further explanation for the null effect of message framing may be due to the novelty of the control message participants were presented with (Dahl et al. 2003; Vinokur and Burnstein 1978). Internet users reading safer sex persuasive messages are reported to prefer straightforward and accurate information (Mimiaga et al. 2010), with pictures (Lang et al. 2005). Changing complex safer sex behaviours, using a simple brief persuasive message-based intervention that individuals are exposed to only once, may be sufficient to alter cognitions, if the message that is presented to individuals is novel (Latmier, Salovey and Rothman 2007). It could be argued that the control condition with its accurate information outlining the history of the condom (Khan and Anjum 2012), was as novel a message to read as the intervention conditions that put forward premises about the type of individual who does (positively-framed), and does not (negatively-framed) perform these condom-related behaviours (Blanton et al. 2001). Performance of condom-related behaviours is more relevant to sexually active

individuals *not* in a committed relationship (Bolton, McKay and Schneider 2010), compared with those in committed relationships, who are more likely to be using a long-acting method of contraception for pregnancy prevention (Huber and Ersek 2009).

Across the lifespan, practicing safer sex is more relevant to some individuals than others, due to relationship status. Arguably therefore, message framing in a broad population may not be as important as it would be for more targeted populations (Noar, Benac and Harris 2007). Because reading a message about the history of the condom may be interesting and relevant to all individuals across the lifespan. It is, therefore, possible that the message was sufficient to support changes in cognitions, but not behaviour in the short-term (Webb and Sheeran 2006).

Primacy-recency effect on change in cognitions for some condom-related behaviours

The results suggest that there were a different number of changes in cognitions between the condom-related behaviours; four changed for *carrying* behaviour, one for *negotiating* behaviour, and three for *using* behaviour (Table 4.9, page 180). A possible explanation for this is that in the intervention conditions the order of the condom-related behaviour messages was presented as follows; *carrying*, *negotiating* and *using*. The literature suggests that the order of the arguments relating to the TPB constructs in messages may impact on the different changes in cognitions, so that persuasive messages presented last may produce a recency effect (e.g., Armitage and Talbudeen 2010; Murdock 1962). However, results from this study suggest a primacy-recency effect for *carrying* and *using* behaviours, which were presented as the first and last condom-related behaviours in the persuasive message (Crano 1977; Panagopoulos 2011). But this does not explain the primacy-recency effect found for the control condition. The overall primacy-recency effect found may be due to the order of the questionnaire items (Sprott et al. 2006). Each condom-related behaviour and TPB construct was measured in the same order (Table 4.5, page 164). If a different platform for hosting the questionnaire, such as those used in studies two and three of this thesis, which allowed the order of the questions pertaining to each condom-related behaviours

to randomly appear, this primacy-recency effect may not have been found (Bowling 2005).

Reflecting on the finding that only one of the targeted psychological constructs changed

The intervention targeted affective attitudes and MN toward three condom-related behaviours. However, only affective attitude toward *using* condoms increased as a result of participating in the study, regardless of intervention condition (Table 4.9, page 180). It is possible that the ‘safe’ affective belief targeted, which was identified as a key theme in the elicitation study reported in chapter 2, was in this sample, the only belief that was salient and therefore amenable for change (Sutton 2002). Furthermore, in chapter 2, safety was elicited as both an affective and cognitive belief, suggesting that it is an important behavioural belief for individuals considering condom-related behaviours (French et al. 2005). An alternative argument is that the affective belief ‘safe’ is more related to how an individual feels than the ‘trustworthy’ and ‘responsible’ beliefs targeted, which are more related to how others perceive the individual and social representations of the type of person who performs these behaviours (Ajzen 2001; Blanton et al. 2001; Hillier, Harrison and Warr 1998). Arguably, more personally relevant affective beliefs related to an individual’s feelings, rather than social representations of how an individual would feel performing these condom-related behaviours may be more amenable to change through intervention (Ajzen 2006a; Sutton 2002). Therefore, targeting other negative affective beliefs, such as feeling self-conscious from *carrying* condoms, and feeling uneasy *negotiating* condom use, may be better targets for affective attitude change in future safer sex interventions as these are more related to an individual’s feelings.

The argument concerning personal relevance of beliefs may be a reason why MN beliefs were not enhanced. MN was included as a belief in the questionnaire study as the literature suggests that behaviours with a moral element, such as safer sex, can be better predicted by a measure of MN than by general measures of SN (e.g., Ajzen and Fishbein 1970). Although in chapter 3 of this thesis, MN appeared to be a strong predictor of *carrying*, *negotiating* and *using* intention, it may not be an easy belief to manipulate (De Groot and Steg 2009; Manstead and Parker

1995; Ravis, Sheeran and Armitage 2009). Furthermore, in the intervention conditions MN was targeted by what may be perceived as a weak message (Petty and Cacioppo 1984), suggesting that individuals' may wish to perform the condom-related behaviour. It is possible that a stronger message such as, "you should use condoms in the future to protect yourself and your sexual partner from a sexually transmitted infection and unwanted pregnancy", may have changed MN beliefs (Albarracín, Cohen and Kumkale 2003; Covey 2012; Eagly and Chaiken 1993).

Of the directly-measured TPB constructs, changes occurred in attitude, SN and PBC for *carrying* behaviour, SN for *negotiating* behaviour, and attitude for *using* behaviour. This finding suggests that directly-measured TPB psychological constructs are likely to change as a result of questioning individuals' beliefs about condom-related behaviours (Sutton 2002), and further supports the arguments about mere measurement effects from participation in behavioural research (e.g., French and Sutton 2010). This finding however contradicts the literature which argues that changing underlying beliefs change the directly-measured psychological constructs of the TPB (e.g., Ajzen 2006a). Despite this finding, results are consistent with Fishbein and Ajzen's (1981) caution that persuasive messages may change the psychological constructs of the TPB other than those stated in the argument. It may be that the acceptability of the persuasive message may impact on the message effectiveness (Armitage and Talibudeen 2010). This is discussed in detail in section 4.4.3 below.

4.4.3 Acceptability of persuasive messages

Whether a message is viewed as acceptable had been cited as one reason why some persuasive messages change antecedents of, and actual behaviour (Fishbein and Ajzen 1981). The finding that neither of the persuasive messages were viewed more favourably than the control message, may have contributed to why there was no difference between the intervention conditions in changing the psychological constructs of the TPB.

The control message in this study used a shortened version of the history of the condom, previously developed and used in a TPB-based intervention to change

intentions to *carry* condoms by Armitage and Talibudeen (2010). Their study had two conditions, control and experimental, with the experimental targeting the three TPB constructs; attitude, SN and PBC. The authors reported that the experimental message was viewed more favourably than the control message. However, they did not explore demographic differences in message acceptability. Differences found in the present study may be due to the sample. Armitage and Talibudeen's (2010) sample were aged 16 to 18 years old, whereas this sample was aged between 13 and 85 years of age. Findings from this study suggested older individuals' viewed all the messages as more acceptable than younger individuals. This finding may suggest that older individuals read the messages more carefully than younger individuals before judging the message acceptability (Czaja et al. 2010). An intervention aimed at older men, also found that older men viewed the messages they were presented with as acceptable (Coleman et al. 2009). The finding that older individuals may view safer sex messages more favourably than younger individuals is encouraging for future safer sex interventions in a broad population (Sumartojo et al. 1997). As safer sex messages are generally targeted at younger individuals (DoH 2011a), these findings indicate that older individuals would not be offended by messages promoting condom-related behaviours.

Of interest is the finding that males found the history of the condom message more acceptable than females. It is possible that males preferred reading about the history of the condom because these are the preferred barrier method (Gallo, Kilbourne-Brook and Coffey 2012), and the use of a male condom may impact more on male sexual pleasure than the female (Norris and Ford 1994; Schick et al. 2010). For males, reading the history of the condom may be viewed as more acceptable as there are no recommendations for behaviour change (Medical Foundation for AIDS & Sexual Health 2005). Alternatively it may be the simple presentation of the history that males found more acceptable than females (Fogg 2003). Telling the story of why the condom was invented as a means to prevent unwanted pregnancy and reduce STI transmission (Khan and Anjum 2012), may be sufficient to raise awareness of the historical and current need to practice safer sex, but whether this is sufficient to change antecedents of and condom-related behaviours in the long-term would have to be explored further.

4.4.4 Brief messages as a tool to change psychological constructs of the TPB

In the current study, the intervention messages were purposely composed to be brief, taking study participants less than one minute to read, similar to those used in the SWTA Campaign (DoH 2011a). Findings from this study suggested that individuals who spent more time reading the messages did not report larger changes in TPB constructs than those who spent less time. However, although LifeGuide captured the time individuals spent reading the messages; it is unknown how much these individuals engaged with the message (Myint-U et al. 2010). The literature suggests that the more an individual engages with reading a persuasive message, the more likely this will result in better recall of the message when the behaviour is required (e.g, Eagly, and Chaiken 1993; Hee et al. 2007; Petty and Cacioppo 1984; Skalski et al. 2009). Despite the messages being very brief, and it not being known how much individuals engaged with reading the message, findings do suggest that brief messages may be sufficient to prompt individuals into thinking about the benefits of performing condom-related behaviours (DoH 2010), which may translate into actual behaviour in the future when required.

One way to strengthen and reinforce these brief messages would be exposing individuals to the message multiple times (Gold et al. 2011), as happened with the SWTA campaign (DoH 2011a). Promoting condom-related behaviours in a broad population is difficult as these behaviours are not personally relevant for all individuals (sections 1.2 and 4.1.1, pages 8 and 148), but brief messages delivered by an expert source such as NHS direct (NHS Direct 2011), may be a cheap and effective way to change antecedents of condom-related behaviours (Ajzen 2012). Arguably therefore, these results support the use of brief textual messages to promote condom-related behaviours in a broad population.

4.4.5 Using LifeGuide to deliver a safer sex intervention

The safer sex intervention appeared to be of interest to a number of individuals. However, of those who clicked on the intervention link only 20% created a LifeGuide account enabling them to participate in the study (Figure 4.1, page 158). In terms of click-through rates this is a high percentage (Konstan et al. 2005), but it also suggests that some individuals interested in participating in online safer sex

interventions may wish for greater anonymity than a LifeGuide-based intervention can provide. This is also one reason individuals report reluctance in approaching health care professionals face-to-face with sexual health concerns (Quilliam 2011; Nusbaum and Rosenfeld 2004). If individuals were able to stay anonymous and participate in the pre-post intervention, and then have the choice to leave their email address to be contacted at a later date, this might increase sample sizes in online safer sex intervention. New ways of delivering safer sex intervention may be required that collect less demographic information from participants, do not require 'sign-up' to an intervention, or any contact details. Although this method of delivery would make it difficult for long-term monitoring of behaviour if participants choose *not* to provide contact details, it may mean that a large proportion of individuals are exposed to the intervention (Keller and Brown 2002; Pequegnat et al. 2007).

Findings from this study suggest that because LifeGuide-based interventions require users to create a LifeGuide account, this platform may not be appropriate for future safer sex interventions (Pequegnat et al. 2007). The reader is directed to Appendix 11 for a more detailed methodological review of developing and delivering a LifeGuide-based intervention. In relation to the use of LifeGuide, this study has contributed to the growing body of literature on the applications of the LifeGuide software for delivering and evaluating behaviour change interventions (Yardley et al. 2009), and supports the use of LifeGuide particularly when intervention development costs need to be kept to a minimum (Wright 2005).

4.4.6 Promoting condom-related behaviours in a broad population

If safer sex messages are aimed at a broad population, and frequently advertised using persuasive technologies (Fogg 2003), then positive changes in attitudes toward these condom-related behaviours may be achieved long-term at a population level (Snyder et al. 2004; Yzer, Siero and Buunk 2000). Findings from the current intervention study suggest that for a public health approach to promoting condom-related behaviours, raising awareness and 'nudging' may be sufficient to change cognitive antecedents of behaviour (Marteau et al. 2011), yet whether this translates into actual safer sex behaviour when required still needs to be established. Harnessing the power of social media to deliver safer sex messages has the potential to be cheap and effective for changing health risk

behaviours (Bull et al. 2012a; NHS Direct 2012), given the increasing number of internet and social media users (section 1.5, page 45), and perceived acceptability of safer sex messages on these websites (Mimiaga et al. 2010).

4.4.7 Study strengths and limitations

This study has two major strengths. First, it is the first online safer sex study to use brief persuasive messages to attempt to change three condom-related behaviours in a broad population. This approach has enabled promotion of condom-related behaviours in populations often overlooked in safer sex interventions (e.g., Bodley-Tickell et al. 2008; Bowleg 2011; Card et al. 2011; Nusbaum and Rosenfeld 2004). Furthermore, taking an online approach allows individuals to access the intervention at a time convenient to them (Kraft and Yardley 2009), read the persuasive messages at their own pace (Pequegnat et al. 2007), and avoid potential embarrassment when discussing safer sex with a health care professional (Quilliam 2011). Second, the use of a longitudinal randomised control design and ITT analysis meant that all individuals who completed pre-intervention measures were included in the final analyses. Elliott and Armitage (2009: 113) argued that although ITT analysis “provides conservative estimates of intervention effects, those conservative estimates are likely to be more valid than are estimates based on just those participants for whom all data are available.” Therefore, the effects of the intervention are likely to be generalisable to a wider population.

The study also has several limitations other than the unknown involvement with the message discussed in section 4.4.4 (page 186). The sample of participants self-selected to complete the intervention may not be representative of a broader population (Hartman et al. 2002). However, it is likely that the significant findings obtained in this study with regard to the increase in intentions to *carry* and *use* condoms, would be applicable to all individuals who are currently sexually active or may consider becoming so in the future. The reported effect sizes for the changes in TPB psychological constructs are small. This finding is consistent with Fife-Schaw and Abraham's (2009) argument that magnitude of change that can be expected from TPB-based interventions in relation to condom *use* is likely to be small. However, these small effect sizes have the potential to accumulate into larger effects if intentions to *not* practice unsafe sex, are successfully changed and

maintained long-term, which results from this intervention suggests occurred (Crosby and Rothenberg 2004). In addition, as discussed in section 4.4.5 (page 186) although free to use, LifeGuide may not have been the most appropriate platform to deliver the safer sex intervention. However, the T1 sample size obtained after 3-months recruitment compares favourably with other studies of condom-related behaviours (e.g., Armitage and Talibudeen 2010; Blanton et al. 2001; Brown, Hurst and Arden 2011; Bryan, Aiken and West 1997; Mevissen et al. 2011), and was sufficient to find an effect according to the G*Power calculations (section 4.2.2, page 157).

5.5 Conclusion

Findings from this study have added to the limited existing literature on delivering brief online interventions to promote multiple condom-related behaviours in a broad population. The intervention study results suggest that the positive changes in intention to *carry* and *use* condoms that occurred from participating in the intervention, regardless of intervention condition and relationship status, are encouraging for future public health approaches aiming to reduce the incidence of STIs and unwanted pregnancies. Although behaviour did not change, having stronger intentions to perform, and more positive attitudes towards performing these behaviours may serve a protective function in the future if performance of these behaviours is required (Wight, Plummer and Ross 2012). As the internet is a medium that at low cost can reach a wide audience (White 2006), future promotion of safer sex on a public health level should consider persuasive messages on the internet (Bennett and Glasgow 2009). It should be considered that raising awareness of condom-related behaviours, and repeated questioning of individuals about their intentions to perform these behaviours, may be sufficient to change future safer sex behaviours. This would be consistent with the current UK Government's views of 'nudging' to engender behaviour change (DoH 2010), and using persuasive technologies to promote condom-related behaviours would be a simple way of achieving this (Piniewski, Codagnone and Osimo 2011). Kalichman, Carey and Johnson (1996) recommend that evaluations of safer sex interventions should monitor behaviour change beyond post-intervention measures; this would be extremely useful to explore the effects of simple interventions promoting condom-related behaviours in a broad population.

Chapter 5

General Discussion

5.1 Summary of findings

This thesis aimed to develop, deliver, and evaluate an online safer sex intervention designed to promote performance of multiple condom-related behaviours in a broad population. The Theory of Planned Behaviour (TPB) was used to develop the intervention (Ajzen 2006a), as it has been frequently shown to predict condom-related behaviours (e.g., Albarracín et al. 2001; Armitage and Talibudeen 2010; Protogerou and Turner-Cobb 2011). The TPB was extended to include psychological constructs shown to enhance its predictive value; affective attitudes and moral norm (MN) (Conner and Armitage 1998; Jellema et al. 2013; Ravis, Sheeran and Armitage 2009). Specifically, attitudinal, normative, and control beliefs most predictive of intention to perform different condom-related behaviours in a broad population were sought as targets for the intervention (Ajzen 2006b; Sutton 2002). Evidence of the usefulness of the TPB for development and implementation of an intervention was gathered, as well as using online methods for TPB-based research and intervention delivery.

The three studies in this thesis followed the recommended stages of TPB-based intervention development research; elicitation study, questionnaire study and intervention study (Ajzen 2006a; Francis et al. 2004; Sutton 2002). The elicitation study (chapter 2) explored affective, cognitive, normative, and control beliefs toward performing five condom-related behaviours in a broad sample. The results of this study indicated that some beliefs were evident across condom-related behaviours, and other beliefs were specific to particular condom-related behaviours. The questionnaire study (chapter 3) identified the beliefs and condom-related behaviours to target in the intervention study. Results indicated three condom-related behaviours; *carrying*, *negotiating*, and *using* should be targeted in the intervention, and the focus should be on enhancing affective attitudes and MN beliefs toward performing these condom-related

behaviours. The intervention study (chapter 4) randomised participants to one of three message conditions; control, positively- or negatively-framed. The intervention conditions targeted both affective and MN beliefs toward *carrying*, *negotiating*, and *using* condoms. Results suggested that self-reported performance of condom-related behaviours did not increase over time, however, intentions to *carry* and *use* condoms increased, but this did not differ between conditions. Of the psychological constructs, improvements in directly-measured attitudes toward *carrying* and *using* condoms, directly-measured SN toward *carrying* and *negotiating* condoms, directly-measured PBC toward *carrying*, and affective attitudes toward *using* condoms were found. Table 5.1 (pages 192 and 193) summarises these studies. The following sections of this chapter focus on theoretical issues relating to the TPB drawn out in this thesis that have implications for future research. In addition, the implications for promoting safer sex in a broad population are considered.

Table 5.1: Summary of the three studies reported in chapters 2, 3 and 4 in this thesis

Chapter	Sample	Aims	Methodology	Results
2	n = 26, aged between 13-74 years old, male = 12, female = 14	To elicit extended TPB beliefs toward performing five condom-related behaviours in order to design a TPB questionnaire, and to determine whether different behavioural beliefs are elicited from affective and cognitive questions.	Open-ended questions using an online survey. Data were analysed using content, proportional and MANOVA analyses.	Results suggested that there were twelve attitudinal, nine normative and seven control themes for the five condom-related behaviours, which were consistent with the existing literature. Further data analysis suggested that some beliefs are both affective and cognitive, whereas others are more likely to be elicited as only a cognitive or affective belief. The final analysis suggested that individuals cite more positive cognitive and normative beliefs than negative beliefs toward these five condom-related behaviours.
3	n = 363, aged between 13-74 years old, male = 127, female = 236	To identify beliefs and condom-related behaviours to target in a safer sex intervention.	Online cross-sectional questionnaire study. Data were analysed using Pearson's correlations, linear regressions, and MANOVA.	Results revealed relationships between TPB constructs where theoretically no relationships are assumed. Further analyses suggested that affective and MN beliefs were most predictive of intention to carry, negotiate and use condoms, and therefore should be the beliefs and behaviours to target in the safer sex intervention. A final set of analyses indicated that a 'one-size fits' all intervention for a broad population would be appropriate, as few differences were found between the demographic sub-samples.

Table 6.1 (continued): Summary of the three studies reported in chapters 2, 3 and 4 in this thesis

Chapter	Sample	Aims	Methodology	Results
4	n = 439, aged between 13-85 years old, male = 129, female = 310	To deliver and evaluate an online safer sex intervention targeted at the general population that promotes performance of three condom-related behaviours; carrying, negotiating and using.	Online longitudinal RCT. Participants completed a brief TPB questionnaire at baseline, immediately post-intervention, and three-month follow-up. Participants were randomised to one of three intervention conditions. Data were analysed using intention-to-treat MANOVAs.	No differences were found between the experimental conditions in terms of change in psychological constructs. However, over time there were increases in five of the six measured psychological constructs, but these changes differed by condom-related behaviours. Participating in the study did not increase self-reported performance of the three condom-related behaviours. However, individuals not in a relationship report to carry condoms more so than individuals not in a relationship.

5.2 The TPB and condom-related behaviours

5.2.1 Predicting condom-related behaviours using the TPB

Whilst the psychological constructs of the TPB appear to consistently predict condom-related behaviours (e.g., Albarracín et al. 2001), the research reviewed in chapter 1 suggested that other psychological constructs such as affective attitudes (e.g., Norton et al. 2005), and MN (e.g., Godin et al. 2005), may enhance the prediction of condom-related behaviours beyond that of the typical TPB constructs. The studies reported in chapters 3 and 4 of this thesis support this assertion. Furthermore, a key finding in chapters 3 and 4 was the limited value of control beliefs, and the directly-measured PBC construct in predicting five condom-related behaviours, supporting the literature reviewed in chapter 1 (section 1.3.4, page 27). The limited value of the addition of PBC for predicting condom-related behaviours suggests that an extended Theory of Reasoned Action (TRA; Ajzen and Fishbein 1972) rather than an extended TPB maybe a better model for explaining condom related-behaviours.

Despite this, findings from the intervention study suggested that directly-measured PBC toward *carrying* condoms was strengthened from participation in the intervention study regardless of intervention condition (section 4.3.3, page 170). This result contradicts findings from Armitage and Talibudeen's (2010) condom-*carrying* intervention study, where PBC did not change. Outcomes from analysis in this thesis suggest that *carrying* behaviour, unlike *negotiating* or *using* behaviour, is a behaviour where individuals perceptions of control are relevant to whether the behaviour happens or not (Eagly and Chaiken 1993), as it does not rely on co-operation from another individual (Bennett and Bozionelos 2000). PBC may also be a useful psychological construct to consider for *accessing* behaviour, as this is also largely under the sole control of an individual (Bryan, Aiken and West 1997). Generally, safer sex interventions focussing on condom *use* that attempt to strengthen PBC have had limited success (Mize et al. 2002). The results from the studies in this thesis, combined with the existing literature, lend themselves to a recommendation for future safer sex interventions to use psychological constructs from an extended TRA;

focussing on affective attitudes (Norton et al. 2005), and the moral reasons for practising safer sex (Greenwood 2011).

5.2.2 The role of affective attitudes in safer sex interventions

Throughout this thesis it has been argued that it is important to separate affective and cognitive attitudes towards condom-related behaviours (e.g., section 1.3.6, page 29), as individuals are more likely to perform behaviours based on their feelings rather than their knowledge (Brown and Mackay 2012; Lawton, Conner and McEachan 2009; Norton et al. 2005). Chapter 2 results suggested that some attitudinal beliefs are more likely to be elicited as either an affective or cognitive belief (section 2.3.2, page 87). Chapter 3 results suggested that affective beliefs were more predictive of *carrying*, *negotiating* and *using* intentions than cognitive beliefs. However, in chapter 4, only the affective belief for *using* condoms was strengthened from taking part in the intervention study, possible reasons for this have been discussed (section 4.4.2, page 179). For example, feeling ‘safe’ from *using* condoms may have been the only belief that was salient and therefore amenable to change. Results from these studies suggest that when exploring condom-related behaviours affective attitudes should be considered for intervention purposes. Targeting feelings toward performing these behaviours through intervention is more likely to change behaviour in the long-term (Norton et al. 2005). In addition, reminding individuals of the benefits of performing condom-related behaviours (i.e., cognitive attitudes), is likely to strengthen directly-measured attitudes (Fishbein and Ajzen 2010; Garcia-Retamero and Cokely 2011), as found in the intervention study (section 4.4.2).

Fishbein and Ajzen (2010) prefer to label cognitive attitudes as ‘*instrumental*’ and affective attitudes as ‘*experiential*’ as they believe these terms to be more neutral. However the different components of attitude are labelled, research needs to consider the impact these attitudes have on behaviour (Ajzen 1991; Fishbein and Ajzen 2010; Breckler 1984). As Breckler (1984: 1191) recognised, affective attitudes can range from “pleasurable to unpleasurable” feelings, whereas cognitive attitudes can vary from “unfavourable to favourable.” Yet

studies in this thesis suggest that it is affective attitudes *and* the social context of condom-related behaviours that need to be considered when attempting to alter condom-related behaviours. As highlighted in the literature review (section 1.2, page 8), condom-behaviours are complex. For safer sex to occur, both sexual partners need to practice safer sex. In chapter 1 it was argued that when *using* male condoms, the male partner is likely to have more control over safer sex than females (section 1.2.3, page 14). Future interventions aiming to change these condom-related behaviours need to acknowledge this complexity, and the power of affective attitudes in predicting intentions toward performing condom-related behaviours.

5.2.3 Using the TPB to develop an intervention

Although guidelines are available that inform researchers of the statistical methods to use for identifying the TPB beliefs to target in an intervention (e.g., von Haefen et al. 2001), there is still a paucity of literature on how to change these beliefs (Sutton 2002). Descriptions of interventions tend not to explicitly explain the methods used to change behaviour (Schaalma and Kok 2009). Taxonomies have been developed that define behaviour change techniques (e.g., Abraham and Michie 2008; Michie et al. 2009; Michie et al. 2011), and more recently these give examples of how these techniques may be applied (Michie et al. In preparation). Recent research has outlined the optimal way to change self-efficacy for promoting physical activity (Ashford, Edmunds and French 2010; Williams and French 2011), but to date, similar papers do not exist for explaining optimal approaches for changing affective attitudes and MN beliefs toward performing condom-related behaviours. Therefore, the existing literature was used to guide development of the intervention materials. The use of persuasive messages as a behaviour change technique is discussed in more detail in section 5.2.4 below.

5.2.4 Persuasive message as a technique for changing behaviour

Persuasive messages were chosen as the behaviour change technique used in the intervention study reported in chapter 4 of this thesis, as they have been

widely used as a method for changing beliefs (Ajzen 2006a; Fishbein and Ajzen 1981; 2010). The benefits of persuasive messages is that they have the ability to reach a wide audience when delivered using online technology (Fogg 2003; Griffiths et al. 2006), and are an inexpensive method to promote changing health risk behaviours (Cabinet Office Behavioural Insights Team 2010). There is literature which suggests that accentuating the negative in a persuasive message that target salient beliefs may be more effective at changing behaviour than accentuating the positive (e.g., section 1.4.1, page 36). Therefore, the content of the persuasive messages used in the intervention study tested the message framing recommendations of Blanton et al. (2001).

It is widely accepted that although persuasive messages can be tailored to apply to a general audience (Flynn et al. 2007; Hill and Abraham 2008; NICE 2007), the impact on behaviour change is small compared to more intensive techniques such as motivational interviewing (Webb et al. 2010). Findings from the intervention study supported this literature, as effect sizes from reading the persuasive messages were small (section 4.3.3, page 170). However, changes in cognitions were identified regardless of whether a negatively- or positively-framed persuasive message targeting the TPB constructs or a control message was read, a finding not uncommon in the literature (Brown, Hurst and Arden 2011; Cin et al. 2006; Henderson et al. 2007; Sanderson and Jemmott 1996). Reasons for this finding, relating to mere measurement effects were discussed in chapter 4 (section 4.4.2, page 179). Although findings do not support the use of targeted persuasive messages as a technique to promote the performance of condom-related behaviours, the mixed findings from the intervention study do have important implications for practice. These implications are explored further in section 5.5 (page 200).

5.3 Effects of individuals participating in multiple studies within this thesis

The current thesis consisted of a series of empirical studies in order to inform the development of a TPB-based intervention. The exploratory studies undertaken (reported in chapters 2 and 3) prior to the intervention study (reported in chapter 4) are crucial in terms of developing an intervention. This exploratory research ensures that the intervention targets are appropriate for the target population (Ajzen 2006a; Francis et al. 2004; Sutton 2002). In the studies reported in chapters 2 and 3, study participants were given the option to provide an email address if they wished to participate in subsequent studies in this thesis (see section 2.2.4, page 64). Similarly, participants involved in the piloting of the ACNUD scale used in the cross-sectional study (section 3.2.3, page 116), were given the option to be involved in subsequent studies. The number of individuals who participated in more than one study is shown in Table 5.2.

Table 5.2: Number of individuals participating in more than one study in this thesis

Study combination	Number of individuals
Elicitation and questionnaire pilot	8
Elicitation, questionnaire pilot and cross-sectional	4
Elicitation, questionnaire pilot, cross-sectional and intervention	4
Questionnaire pilot and cross-sectional	1
Questionnaire pilot, cross-sectional and intervention	2
Cross-sectional and intervention	1

The number of individuals presented in Table 5.2 is taken only from those who provided email addresses. Therefore, there may have been more individuals who participated in more than one study but did not provide an email address. There were four individuals who participated in the three studies reported in this

thesis as well as the piloting of the questionnaire. In section 4.4.2 (page 179) it was discussed that mere measurement may have contributed to the null effect of the intervention condition, but it also needs to be acknowledged that a mere measurement effect may have been present throughout this thesis for individuals who participated in more than one study in this thesis (e.g., French and Sutton 2010; Morwit and Fitzsimons 2004; Ogden 2003; Sherman 1980). Individuals participating in multiple studies may be more inclined to respond in a socially desirable way (Dyer 1995; Murray 2004; Sommer and Sommer 1997). For example, if individuals read the participant debrief sheets for prior studies they therefore knew the outcome the researcher was trying to achieve, in turn this may have influenced their responding in subsequent studies. In the current thesis the number of individuals participating in multiple studies was low (Table 5.2, page 198). Therefore any mere measurement effects from individuals participating in multiple studies would be unlikely to have affected the findings. However, this issue of multiple study participation should be considered in other research using a TPB-based approach to intervention development where there may be overlap in participants sampled in the informative studies and the final intervention study.

5.4 Using online software for intervention delivery

As discussed in chapter 4 (section 4.4.5, page 186), LifeGuide may have contributed to the low 'click through' rate as participants had to create a LifeGuide account. Bowen et al. (2008) recognise that especially when online safer sex interventions offer incentives for taking part, such as monetary payment, participants may complete interventions multiple times to take advantage of these incentives. Bowen et al. (2008) suggest that participants having to create an account with a username and password reduces the number of same users completing the intervention multiple times. However, as found in the intervention study in this thesis, when no incentive is offered for participation, then participants may choose not to participate when full anonymity is not offered. This issue will be discussed further in section 5.6.1 (page 203) as an avenue for further research.

Another issue with online delivery of interventions is that the population completing the intervention may not be the same as those the intervention has been developed for (Pequegnat et al. 2007). TPB-interventions are developed through a series of elicitation and ‘main’ studies in the target population in order to identify the beliefs that predict the behaviour to be promoted in the intervention (Ajzen 2006a; Fishbein and Ajzen 2010; Sutton 2002). Due to the growing accessibility of the internet, populations for whom the intervention was *not* intended may participate, as online eligibility screening is more difficult than offline screening (Fogg, 2003). Having populations other than those who the intervention is aimed participating in the intervention may mean that the evaluation of the intervention could appear less effective than it actually is, as the sample is likely to include individuals with different beliefs than those that the intervention was targeted at (Abraham, Norman and Conner 2000; Ajzen 2006a; Finlay, Trafimow and Moroi 1999; Fishbein and Azjen 2010).

5.5 Implications for promoting safer sex in a broad population

Since the AIDS public health campaigns of the 1980s there have been few public health safer sex campaigns (Aggleton, Davies and Hart 1994). Whilst tailored interventions are important (Noar, Benac and Harris 2007; Sumartojo et al. 1997), broad population mass media interventions also have a role too (Flynn et al. 2007; Sumartojo et al. 1997). Furthermore, successful performance of safer sex relies on a process of condom-related behaviours (section 2.1.1, page 53), yet few interventions have promoted multiple condom-related behaviours (Hill and Abraham 2008). Arguably therefore, it was important that this thesis aimed to design, deliver and evaluate an intervention promoting performance of multiple condom-related behaviours applicable to a broad population, which links to the Government’s social marketing approach to behaviour change (DoH 2011b). Findings from this thesis have implications for promoting safer sex in a broad population.

Previous research has indicated that to increase the effectiveness of motivational interventions individuals need to remember and act upon messages when the requirement to perform the behaviour presents itself

(LaBrie et al. 2008). One method for ensuring the message is remembered is through individuals forming implementation intention plans following reading a safer sex message, where individuals state where, when and how they would perform condom-related behaviours (Gollwitzer 1999). Formation of implementation intentions take minutes, and has often been successful in enabling behaviour change (Sniehotta, AraújoSoares and Dombrowski 2007). However, research suggests when individuals are required to produce multiple implementation intention plans for condom-related behaviours; many of these plans are incomplete and therefore not very useful (de Vet et al. 2011). Furthermore, implementation intentions are unlikely to be useful in a broad population where the consistent performance of condom-related behaviours is not as relevant for individuals in committed relationships (Bolton, McKay and Schneider 2010).

Although the intervention developed in this thesis through prior research did not increase self-reported performance of condom-related behaviours, findings have suggested that a brief general message-based intervention, taking less than one-minute to complete, may be developed that is applicable to a broad range of individuals. Furthermore, reading either a targeted or control message about condom appears to increase the cognitive antecedents of behaviour, which may prompt performance of condom-related behaviours in the future. Yzer, Serio and Bunnk (2000) evaluated the effects of a Dutch safer sex campaign run three consecutive years between 1994 and 1996 called '*I have safe sex or no sex*' aimed at a broad population. The campaign was designed to target the constructs of the TPB. In 1996 the campaign was not run, and in 1997 the authors explored the effects on TPB constructs for the years the campaign was and was not run. Findings demonstrated that the TPB constructs "became less positive with respect to safer sex in the period in which no campaign was conducted" Yzer, Serio and Bunnk (2000: 349). This finding suggests developing, and continually delivering safer sex campaigns to broad populations will promote and sustain positive attitudes, normative and control beliefs and increase intentions to practice safer sex.

In addition, findings of the effects of the intervention study in this thesis compare favourably with other brief intervention studies based on power of communicating health messages rather than targeting psychological constructs of the TPB. For example, in America, Myint-U et al. (2010) used a step-wise process similar to that used in this thesis to develop a brief video-based intervention that could be shown in sexual health clinic waiting rooms applicable to a broad audience. The video consisted of three separate stories showing couples discussing *accessing*, *negotiating*, *using* and *disposing* of condoms, and lasted 23 minutes. Individuals viewing the video found it acceptable, and 80% of those who viewed the video were able to recall at least one message. Evaluation of this video intervention found that a year later individuals who had watched the video were significantly less likely to return to be diagnosed with an STI than individuals who had not watched the video (Warner et al. 2008). Similarly, the *Sex. Worth Talking About* campaign (DoH 2011a; section 1.1, page 1) targeting younger individuals, lasted seconds as a television campaign, and could also be read in poster format in a matter of seconds, increased the number of young women requesting appointments with health care professionals (HCPs). Although in this thesis, neither attendance for sexual health screening nor visits to a HCP were measured as behavioural outcomes for the intervention study. The increases in intentions to *carry* and *use* condoms, may result in future behaviour change, which might include visiting a sexual health clinic or talking to a HCP.

It can be argued that the studies reported in this thesis have demonstrated that a public health approach to safer sex is feasible, as sub-populations do not widely differ on cognitive antecedents of condom-related behaviours (section 3.3.3, page 131). Brief messages demonstrating that the condom has been used as an effective method of birth control and STI prevention for many years, and the benefits of performing condom-related behaviours could be created that can be shown on the television and internet, and as posters for display in schools and GP surgeries. These messages can be applicable to a broad population if they highlight the fact that even women using hormonal

contraceptives may at times need to also *use* condoms (Faculty of Family Planning and Reproductive Health Care 2005; Royce, Perlmuter-Silverman and Krauss 2007). Similarly, highlighting that there are three ‘types’ of condom available for different sexual practices would be relevant for a broad population (Vijayakumar et al. 2006). Findings from this study suggest that simple straight forward messages would appeal to a broad range of individuals and change the cognitive antecedents toward condom-related behaviours (Flynn 2007; sections 4.4.2 and 4.4.3, pages 179 and 184). Future research could longitudinally assess the impact on behaviour through monitoring of attendances at sexual health clinics for STI testing, and GP surgeries for sexual health advice.

5.6 Recommendations for future research

In chapter 4, recommendations were made for using a Solomon design in future safer sex interventions to explore mere measurement effects (section 4.4.2, page 179). However, there are other studies which would be useful to undertake in relation to online safer sex interventions, TPB-based interventions and the effects of more interactive persuasive messages. These proposed studies are discussed below.

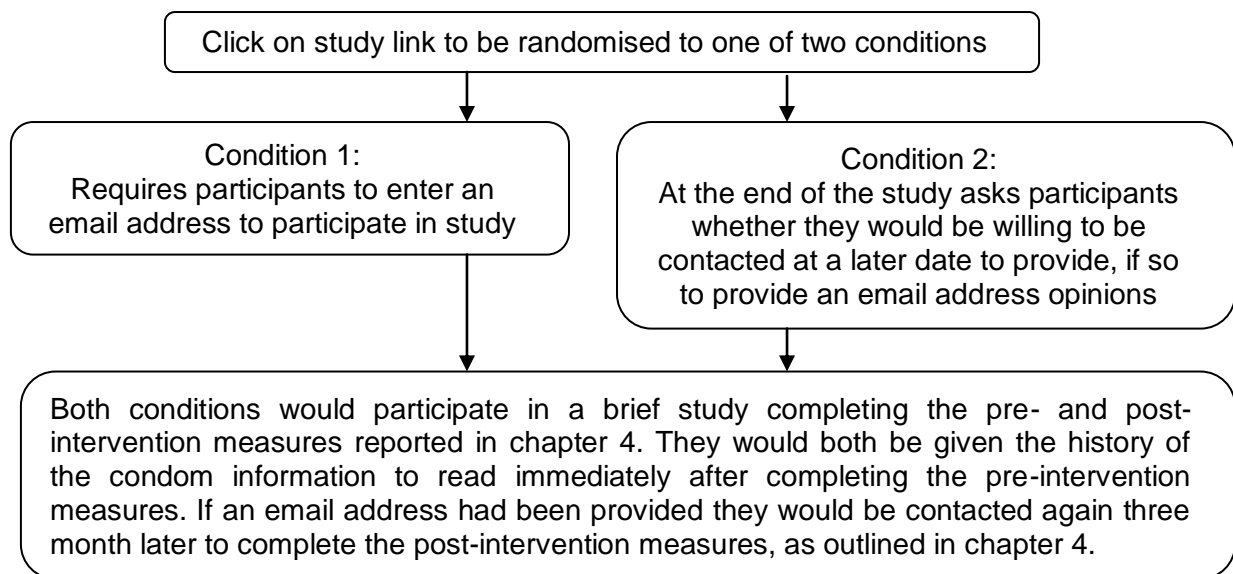
5.6.1 Recruitment and retention of participants in online safer sex studies

The attrition rates in online safer sex interventions tend to be higher than in face-to-face studies (Bailey et al. 2010), which was found in the intervention study reported in chapter 4. Clearly, throughout the empirical chapters of this thesis there have also been a number of individuals who click on the study link but subsequently either; do not participate in the research, or partially complete the research (e.g., section 3.2.2, page 114). This non-compliance is a common problem with online research (e.g., Albarracín et al. 2008a; Pequegnat et al. 2007), particularly with longitudinal intervention studies (e.g., Huebner et al. 2011; Noguchi et al. 2007). Further research to identifying methods to enhance click-through rates (Konstan et al. 2005), and retaining individuals in longitudinal research would be a useful avenue for further research.

In this thesis, the questionnaires used to collect data followed a typical layout; demographic information was collected first, followed by psychological measures (Brown, Hurst and Arden 2011; Bryan, Aiken and West 1997; Mevissen et al. 2011; Reisner et al. 2011). In the cross-sectional study reported in chapter 3, this resulted in a large percentage of individuals completing only the demographic sections (e.g., section 3.2.2, page 114). Although the number of demographic items collected were similar to other TPB-based studies (e.g., Bryan, Aiken and West 1997; Werch et al. 2008; Zemoire, Kaskuas and Alcohol Research Group 2009), future research should explore the impact of ordering demographic and psychological items in a “non-systematic manner” (Conner, Graham and Moore 1999: 800). This may increase retention by reducing response fatigue (Streiner and Norman 2008). Demographic information is required so that differences between groups can be explored (e.g., Muñoz-Silva et al. 2007), which is of particular importance for intervention planning (Ajzen 2006a; Sutton 2002; von Haeften et al. 2001). It has been argued that, if the layout of questionnaires changes from the typical approach, more data may be gathered from the target population, making results more likely to be generalisable (Stephenson, Imrie, and Bonell 2003).

In order to follow-up participants in online longitudinal interventions, contact details for individuals are required (Hallett et al. 2009). However, as noted in chapter 4 (section 4.4.4, page 186), some individuals may choose not to participate in research of a sensitive nature where anonymity is not an option (Pequegnat et al. 2007). Online safer sex interventions have the potential to offer full anonymity, which could be useful for promotion of condom-related behaviours in a broad population (Albarracín et al. 2008b; Sumartojo et al. 1997). Giving participants the option to remain anonymous is likely to still result in participants being lost to follow-up, if participants choose not to provide contact details, but intention-to-treat analysis may be applied to these individuals (Shao and Zhong 2003). To assess whether anonymity choice increases recruitment to online safer sex studies, a simple study maybe undertaken as illustrated in Figure 5.1 (page 205).

Figure 5.1: Proposed study to determine whether anonymity choice increases recruitment rates



The simple study proposed in Figure 5.1 has the potential to contribute to the literature in a number of ways. First, the demography of individuals wishing to stay anonymous could be compared to those who are willing to provide contact details, to determine if some populations prefer anonymity to others (Albarracín et al. 2008b; Noguchi et al. 2007). Second, individuals in the second condition are given the opportunity to ‘try’ the study before deciding whether they wish to participate in the future. This technique is often used by gyms to recruit new members (Wharf-Higgins 2011). It is possible that there may be differences in demography of these two groups of individuals, which could help future intervention planning. Third, repeated measurement with no intervention would further contribute to the literature on mere measurement effect (e.g., French and Sutton 2010), and determine whether a novel control message has the potential to change the psychological constructs of the TPB and/or condom-related behaviours (Dahl et al. 2003; also section 4.4.2, page 179).

5.6.2 A “think aloud” study to explore reactions to the questionnaires and intervention materials

Previous research suggests that when individuals respond to TPB-based questionnaires they may answer questions differently to how the researcher

intended (French et al. 2007). Similarly, when completing interventions, individuals may not view the materials in the same way as the researchers (Morrison et al. 2009). To explore how individuals complete TPB-based questionnaires, and react to intervention materials, ‘think-aloud’ studies can be used to explore thoughts as they occur during engagement, which then inform researchers about how questionnaires and intervention materials can be made less ambiguous for users (French et al. 2007; Morrison et al. 2009). ‘Think-aloud’ studies require participants to report their thoughts whilst completing questionnaires and viewing intervention materials (Darker and French 2009). A ‘think-aloud’ study would be a unique approach for understanding how individuals respond to an online safer intervention and associated psychological measures. Data could be used to inform redevelopment of the brief online intervention, and explore a number of factors which may have influenced the current findings reported in chapter 4.

The TPB measures used in the intervention study reported in chapter 4 were all single-item measures (Appendix 8: Copy of measures). Although single-item measures were chosen for brevity, it may be that misinterpretation of these single-items results in an incorrect score for the individual (van Oort, Schröder and French 2011), or the questionnaire layout may not aid easy responding (Loewenthal 1996; Malacad and Hess 2011). Furthermore, Fishbein and Ajzen (2010) argue that single-item measures are not able to capture the complexity of the TPB constructs. Additionally, the layout and/or content of the intervention materials may have been more difficult to read than envisaged by the researcher (Cameron et al. 2012; von Wagner et al. 2008). Although the intervention website was designed so that it could be easily navigated, it may not have been as simple as the researcher envisaged (Morrison et al. 2009).

5.6.3 More interaction with persuasive messages promoting condom-related behaviours

The intervention study reported in chapter 4 suggested that persuasive and non-persuasive messages changed the cognitive antecedents of behaviour.

The possible appeal of the history of the condom material has been discussed in section 4.4.2 (page 179). However, more interaction with the written material is more likely to increase individuals remembering the message when the situation requires (LaBrie et al. 2008), and ensure individuals act on the health message (Mahmud et al. 2010). This is particularly important for individuals not currently sexually active (Nusbaum and Rosenfeld 2004), or in long-term relationships (Bolton, McKay and Schneider 2010). For these individuals, safer sex messages may not be as relevant, and therefore not immediately translated into actual behaviour change.

In a study by Hill and Abraham (2008) individuals read the ‘wise up to condoms’ leaflet and then completed a quiz to test their learning. This quiz had lines of text where individuals had to fill in the missing word. For example; “Most _____ (missing word = young people) use condoms” (Hill and Abraham 2008: 46). A similar approach could be used with a longer message which outlines the history of the condom, the condom-related behaviours that are required for safer sex to be performed, the three ‘types’ of condom that are available, and state why condom related behaviours are relevant to a broad range of individuals. Once the message has been read, individuals could complete a word-search, where similar to the format used by Hill and Abraham (2008) words from the original message are missing and individuals have to find these in the word-search grid. This type of simple game for promoting condom-related behaviours is likely to increase knowledge and promote positive attitudes toward these behaviours (Hastings-Asatourian 2005; Papastergiou 2009). In the health field, gaming is becoming more widely used as a way to deliver health messages (Louise, Renaud and Kaufman 2008). Games may be fun for the users, whilst at the same time deliver a serious health message (Brown, Bayley and Newby 2012). Games can be designed to be intergenerational, appealing to both young and old players (Khoo, Merritt and Cheok 2009).

5.7 Conclusions

The current thesis contributes to the literature by evaluating the usefulness of an extended version of the TPB for exploring beliefs toward performing five condom-related behaviours, and using these beliefs to develop and deliver an online intervention. Findings suggest that psychological constructs from an extended TRA rather than an extended TPB should be used to develop future safer sex interventions aimed at a broad population.

Findings have contributed to the literature regarding the relationship between TPB constructs. Theoretically the TPB assumes a causal relationship between the psychological constructs (Ajzen 1991). In chapter 3, the analysis recommended by Sutton (2002) correlating each of the psychological constructs with each other, and behaviour were undertaken on the cross-sectional data. The findings partially supported the TPB's assumptions; intention-past behaviour, as well as intention-directly measured attitude and SN correlations were present for all five condom-related behaviours. But there were few significant PBC-intention correlations, and no PBC-behaviour correlations were evident for any of the five condom-related behaviours. As expected from theoretical assumptions, both directly-measured attitude and SN were found to be significantly correlated with self-reported past behaviour, for all five condom-related behaviours. Similarly, cognitive behavioural beliefs and normative beliefs were found to correlate with intention to perform all five condom-related behaviours.

In terms of intervention delivery, the intervention study reported in chapter 4 demonstrated that completing multiple TPB questionnaires coupled with a brief reading task, has the ability to change intentions, affective attitudes, and directly-measured attitude, SN, and PBC toward performing three condom-related behaviours; *carrying*, *negotiating*, and *using*. This finding is encouraging, as it suggests that 'nudging' individuals to consider condom-related behaviours may be sufficient to change the cognitive antecedents of behaviour. However, more evidence is needed to determine whether this translates in future behaviour change, as the findings from chapter 4 suggested that performance

of condom-related behaviours did not change in a 3-month time frame. Brief online interventions have the potential to reach a large audience at low cost, and should be considered in future public health programmes (Griffiths et al. 2006).

Finally, the current thesis provides further evidence of the usefulness of the TPB as a framework for exploring the predictors of condom-related behaviours in a broad population. Findings suggest using these predictors to change intention and self-reported behaviours in a broad population through targeted persuasive messages may have limited impact. This thesis has contributed to the literature applying Ajzen's (2006a) step-wise process for using the TPB to develop interventions. As Hardeman et al. (2002: 123) argue, for behaviour change interventions, the TPB is mainly used to "measure process and outcome variables and to predict intention and behaviour, and less commonly to develop the intervention." However, this thesis has contributed to the growing body of literature using the TPB to develop a behaviour change intervention (Fishbein and Ajzen 2010).

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Appendices

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Appendix 1: Copy of the online exploratory survey with the embedded participant information sheet and consent form

The version included in the appendix was used for the following populations; adults aged 18 – 59 years, LGBT, over 60's, CU staff and CU students. The HCP version had a drop-down menu where profession could be stated, and individuals aged 17 years under version had a second consent form asking them to state their parents had given permission for them to participate.

Due to the surveys being online, the researcher has indicated what information was on each page of the survey including the page headers the participants would have seen onscreen, the response options participants would have been given, and where a drop down box would have appeared. Example screen shots of the online survey have also been included to aid visualisation.

Page one – Information Sheet (version 4 07/06/10)

Title of Project: Buying, carrying, negotiating use, using and disposing: A qualitative exploration study of attitudes toward 5 condom behaviours

Researcher: Jude Hancock

You are being invited to take part in a research study. Before you decide if you would like to take part, it is important that you understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Please email the researcher if there is anything that is not clear or if you would like more information (contact details below). Take time to decide whether or not you wish to take part. Thank you for reading this.

What is the purpose of this study?

This study is part of a doctoral programme exploring safer sex behaviours. This study will ask you to think about condoms (or femidoms or dental dams) and write a short paragraph or bullet points in answer to each question you are given. The study aims to find out what people think about various condom behaviours such as buying and using condoms. It does not matter if you have never used a condom as the study is asking about what you think about condoms and not your experience with them. This study is the basis for developing a questionnaire. It is therefore important that you are honest in your answers and try to answer each question you are given.

Why have I been chosen?

You have been chosen to participate as you are a person who's opinions the researcher values. Furthermore, because of your age you may well have a different perspective about condoms than someone younger or older than you. You may or may not have experience with using condoms (or femidoms or dental dams) and this is important as we need to know the opinions from people who have and have not used condoms.

Do I have to take part?

No. You are under no obligation to take part. If you decide to participate, then you may keep this information and you will be asked to complete a consent form when you log into the study. You will however be free to withdraw at any time, without giving a reason, and without any consequences, should you change your mind.

What will happen to me if I take part?

You will be asked to complete an online survey that will take you about 20-30 minutes to complete. The survey will ask you to think about condoms (or femidoms or dental dams) and write a short paragraph or bullet points in answer to each question you are given. You will be asked at the end of the survey if you would like to receive an invite to a future follow-up study where you will complete a questionnaire about condoms. You are not obliged to receive this invite or to take part if you do receive the invite.

Expenses and payments

There is no payment associated with your participation.

What do I have to do?

You will be required to answer a series of questions about condoms (or femidoms or dental dams). It is up to you whether you would prefer to write a short paragraph to answer the question or would prefer just to bullet point some words that spring to mind. Before the questionnaire starts there will be a definition of what condoms, femidoms and dental dams are to help you. It would be helpful if you try to answer each question but you are free to leave a response blank if you so wish. Your opinions are unique to you and the researcher would be grateful if you would share these. You will only have to answer each question once. You are also able to finish the survey before the end if you do not want to carry on.

Page two – Information Sheet (version 4 07/06/10)

What are the possible disadvantages and risks of taking part?

The greatest disadvantage of taking part is the impact on your time. It is possible that some of the questions asked might raise issues that you find difficult to deal with. If you have any concerns about the questions you have answered there will be a list of support available to you at the end of the survey. There will be no negative consequences for you as a result of your participation. The Coventry University Faculty of Health and Life Sciences Research Ethics Committee has reviewed this study.

What are the possible benefits of taking part?

You will be contributing to a programme of research that will culminate in the development of an intervention that is hoped will help people to have safer sex. Therefore it is likely that you will have some influence on this intervention with the answers you give to the questions, people who complete the intervention in the future may benefit from your feedback.

What happens when the research study stops?

The answers that you give to each question will be added to those given by other people who have taken part. Some quotes that you give may be used in a report of the findings but no-one will be able to identify you, as we will ask for you to create a unique identifier at the start of the survey, then once all the data is collected you will be assigned a participant number. It will be possible for you to obtain a written copy of the results by indicating that you would like to do this on the final pages of the survey (in order for you to do this it will be necessary for you to provide your name and email address). Alternatively you will be able to go to the following website where a copy of the report will be available www.healthinterventions.co.uk. The results are likely to be available in September 2010. If you decide to receive a copy of the report or to opt in to receive information about future research your personal details will be stored separately from the survey information you provide. It is also possible that the results from the study may be written up as academic papers, or presented at academic conferences. In all instances, it will be grouped data that are of interest, not individual opinions.

What will happen if I don't want to continue with the study?

You are free to withdraw from the study at any time by exiting the online survey. In addition, up to four weeks after you have completed the survey if you decide you do not want your data to be used you can contact the researcher (see details below) so that your data can be removed. The researcher will then destroy all information collected about you.

What if there is a problem?

It is unlikely that there will be a problem during the course of your participation in this research study. However, in the unlikely event of a problem with the research please inform the researcher who will try to resolve the matter and if necessary provide you with details of relevant support services. Alternatively you can contact, Dr Katherine Brown, Department of Psychology, Coventry University, Priory Street, Coventry, CV1 5FB (k.brown@coventry.ac.uk, phone: 024 7688 8209). If you are still not happy, you may contact, the Coventry University Ethics Committee Chair, Professor Ian Marshall in writing at AB124, Coventry University, Priory Street, Coventry, CV1 5FB.

Complaints

If after participating in the study, you wish to make a complaint or comment regarding the professional conduct of the study, please, in the first instance contact the researcher.

Harm

There is no anticipated risk of harm involved with participation in this study. There are no compensation arrangements for participation in this research.

Page three – Information Sheet (version 4 07/06/10)

Will my taking part in the study be kept confidential?

All information that is collected about you during the course of the research will be kept strictly confidential. It will not be possible for anyone to identify your particular responses, as at the start of the study you will create your own unique identifier (the method for this will be explained when you log onto the survey) and from this point on the researcher will not know your identity, and no reference to your unique identifier will be made in the write up of research results. In any written reports the researcher will assign you a new unique identifier by which you will be identified. This will be a letter and a number such as P1, which will help the researcher know that you were for example, participant number one, hence P1. In this way anonymity will be maintained. Your completed survey and contact details (if given) will be held securely and all data will be processed in accordance with the 1998 Data Protection Act.

Contact details:

Researcher's name: Jude Hancock

Email: hancoc16@uni.coventry.ac.uk – preferred method of contact.

Research Student's Director of Studies:

Director of Studies name: Dr Katherine Brown

Email: K.Brown@coventry.ac.uk – preferred method of contact.

Postal Address: Department of Psychology, Coventry University, Priory Street, Coventry, CV1 5FB

Phone: 024 7688 8209

Page four – Consent form (version 3 17/05/10)

1. I confirm that I have read and understood the participant information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these questions answered satisfactorily.
2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving a reason.
3. I understand that any information I provide will be kept confidential and that my identity will be kept anonymous.
4. I understand that the data will be treated according to the British Psychological Society Code of Ethics.
5. I understand that that the information I provide may be used and analysed for research purposes and the findings may be published in an academic journal.
6. I understand that I may be asked to take part in an additional component of the research project and that I am under no obligation to take part.
7. I understand that I can request that any information I provide will be destroyed upon request.
8. I agree to take part in the above study.

(The options of Yes, I agree to the above consent form and No, I do not agree to the above consent form appeared)

Example screen shot of a section of the consent form

5. I understand that that the information I provide may be used and analysed for research purposes and the findings may be published in an academic journal.

6. I understand that I may be asked to take part in an additional component of the research project and that I am under no obligation to take part.

7. I understand that I can request that any information I provide will be destroyed upon request.

8. I agree to take part in the above study.

☐ Yes, I agree to the above consent form
 ☐ No, I do not agree to the above consent form

Page five – Instructions

This survey is split into two sections:

1 - Demographics e.g. your age, whether you are male or female

2 - Your thoughts about accessing, carrying, negotiating with a partner, using and disposing of condoms.

Please remember that all of your responses are strictly confidential. Each page will have instructions on how to answer each question. Please read each question carefully and answer it as truthfully as you can – sometimes people choose answers that they think others would want them to or would find most acceptable but we need to know how you really think and feel. There are no correct or incorrect responses; we are simply interested in your personal point of view.

Thank you for your participation in this study.

Page six – Demographics

1. Please create a unique identifier for yourself by putting in your day and month of birth and the first three letters of your mothers maiden name.

e.g. 28/02/FUR

2. Gender - are you:

(The options of male or female appeared)

3. Age - how old are you?

(A drop down menu with ages from 13 to 100+ appeared)

4. How would you describe your ethnic origin?

(A drop down menu with the following NHS categories appeared, White British, White Irish, White Other, Mixed - White and Black Caribbean, Mixed -White and Black African, Mixed - White and Asian, Other mixed, Asian/Asian British - Indian, Asian/Asian British - Pakistani, Asian/Asian British - Bangladeshi, Other Asian, Black/Black British – Caribbean, Black/Black British – African, Other Black, Other Ethnic – Chinese, Other Ethnic)

5. Please pick your highest level of education or the education level you are currently studying for.

(A drop down menu with the following categories appeared, GCSE or O level, Vocational training such a NVQ, A level, Undergraduate, Postgraduate, Other – please state)

6. Sexual Orientation.

To help you answer this question definitions of each category are provided.

Heterosexuals are individuals whose affectional/erotic attractions are to members of the other gender.

Gay (Gay male/Lesbian) are individuals whose affectional/erotic attractions are to members of the same gender.

Bisexuals are individuals whose affectional/erotic attractions are to both men and women.

Please answer the question in relation to how you feel about yourself.

(The options of Heterosexual, Gay male (I am a man and I am attracted to other men), Lesbian (I am a woman and I am attracted to other women), Bisexual appeared)

7. How would you describe your relationship status?

(The options of Single, Married/Civil Partner, Divorced/Person whose Civil Partnership has been dissolved, Widow/Surviving Civil Partner, Separated, In an open/casual relationship, I have a long-term partner appeared)

8. To help you answer the question on sexual experience definitions of each category are provided.

Virgin - we would normally consider somebody a virgin if they have not had sex where a penis enters another person's anus or vagina, though we understand people may have different interpretations.

Non-Virgin - we would normally consider somebody no longer a virgin if they have had sex whereby a penis enters another person's anus or vagina, though we understand people may have different interpretations.

Please answer the question in relation to how you feel about yourself.

(The options of Virgin or Non-Virgin appeared)

Example screen shot of demographics section

6. Sexual Orientation.
To help you answer this question definitions of each category are provided.

Heterosexuals are individuals whose affectional/erotic attractions are to members of the other gender.

Gay (Gay male/Lesbian) are individuals whose affectional/erotic attractions are to members of the same gender.

Bisexuals are individuals whose affectional/erotic attractions are to both men and women.

Please answer the question in relation to how you feel about yourself.

☐ Heterosexual

☐ Gay male (I am a man and I am attracted to other men)

☐ Lesbian (I am a woman and I am attracted to other women)

☐ Bisexual

7. How would you describe your relationship status?

☐ Single

☐ Married/Civil Partner

☐ Divorced/Person whose Civil Partnership has been dissolved

☐ Widow/Surviving Civil Partner

☐ Separated

☐ In an open/casual relationship

☐ I have a long-term partner

Page seven – Condoms, Femidoms and Dental Dams**Condom**

A condom is a flexible sheath, usually made of rubber or latex, designed to cover the penis during sexual intercourse for contraceptive purposes or as a means of preventing sexually transmitted disease during penetrative or oral intercourse.

(A picture of a condom was presented here)

Femidom

A femidom is a similar device to a condom, consisting of loose-fitting polyurethane sheath closed at one end that is inserted intravaginally before sexual intercourse. It is also called a female condom.

(A picture of a femidom was presented here)

Dental Dam

A dental dam is a flexible square, usually made of thin rubber or latex, designed to cover the vagina or anus as a means of preventing sexually transmitted diseases during oral intercourse.

(A picture of a dental dam was presented here)

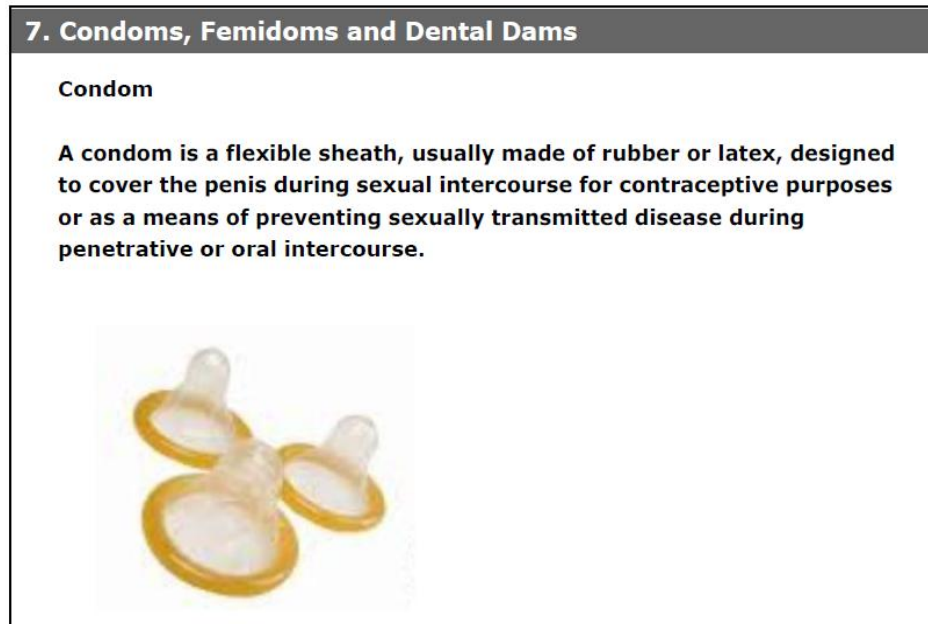
1. For the purpose of this survey the terms 'condoms' will be used to cover the words condom, femidom and dental dam. Before you start to answer questions please pick the safer sex method from the three described that you would be most likely to use in the future. From then on please think about this method when you answer the questions.

(The options of Condom, Femidom, Dental Dam appeared)

On the following page there will be sixteen questions each with five responses that we would like you to answer. Although all the questions have condom in the title we recognise that you may be thinking about a femidom or a dental dam instead and this

is ok. We are interesting in what you think so please try and answer each question as honestly as you can. Please read each question carefully and then write a few words that best describes what you think. There are no right or wrong answers; we are interested in your personal point of view. It may seem like we are asking you the same questions over and over again but we would appreciate you trying to answer each question as they are slightly different.

Example screen shot of the condom page



Page eight – Please think about condoms and respond to each question

1. Have you ever accessed or got hold of condoms? If so how have you done this? If you have how did it make you feel? If you haven't what thoughts do you have about doing this?
2. Have you ever carried condoms on you? If you have how did it make you feel? If you haven't what thoughts do you have about doing this?
3. Have you ever had to ask a partner to use a condom? If you have how did it make you feel? If you haven't what thoughts do you have about doing this?
4. Have you ever used a condom with a partner? If you have how did it make you feel? If you haven't what thoughts do you have about doing this?
5. Have you ever disposed of a condom after use? If you have how did it make you feel? If you haven't what thoughts do you have about doing this?

The following 11 questions required responses to each of the five behaviours being explored. The behaviours were set to appear in a random order under each question for each participant.

Accessing condoms?

Carrying condoms?

Negotiating with a partner to use condoms?

Using condoms?

Disposing of condoms?

6. What do you believe are the advantages of you
7. What do you believe are the disadvantages of you
8. What things would you like about

9. What things would you dislike about
10. Is there anything else you associate with about
11. Are there any individuals or groups who would approve of you
12. Are there any individuals or groups who would disapprove of you
13. Are there any other individuals or groups who would approve of you
14. What circumstances would enable you to
15. What circumstances would make it difficult for you
16. Are there any other issues that come to mind when you think about

Example screen shot of elicitation question layout and presentation

The image shows a screenshot of a survey interface with three sections of questions, each with a title and a list of topics followed by a light blue input field.

9. What things would you dislike about

- Disposing of condoms?
- Using condoms?
- Accessing condoms?
- Carrying condoms?
- Negotiating with a partner to use condoms?

10. Is there anything else you associate with about

- Disposing of condoms?
- Carrying condoms?
- Accessing condoms?
- Using condoms?
- Negotiating with a partner to use condoms?

11. Are there any individuals or groups who would approve of you

- Disposing of condoms?
- Negotiating with a partner to use condoms?

Page nine – Thank you

Thank you very much for taking part in this piece of research. Your contribution has been very important to us.

We will download your data and be analysing your survey responses alongside all the other participants' data to look for common themes. This analysis will then be used to develop a questionnaire exploring the 5 condom behaviours we have been asking you about in this survey.

If you have any questions about this or anything else to do with this research then please feel free to ask. We will be more than happy to answer any questions we can. Alternatively, if you think of something later and wish to get in touch with us, you can do so using the contact details provided below (please remember to write this down before you go to the next page of the survey).

Jude Hancock
Applied Research Centre Health and Life Sciences

hancoc16@uni.coventry.ac.uk

1. If you would like to receive an invite to a future follow-up study where you will complete a questionnaire about condoms please provide your email address.

Remember that you are not obliged to receive this invite or to take part if you do receive the invite.

Page ten – Further support

If you wish to seek further advice or support about sexual health issues below is a list of sources of help, advice and information. There are details of websites, help lines and instructions on how to find your nearest drop-in centre.

How to find your nearest drop-in centre

Go to the NHS website www.nhs.uk

Click on “find and choose services”

Click on “sexual health” (Please note you could use the walk in centre option as well)

In the search box type in your nearest town or city for a list of all drop-in centres available to you.

Remember you can always book an appointment with your own GP, its free and confidential.

Useful websites

www.nhs.uk/worhtalkingabout

www.fpa.orh.uk

www.brook.org.uk

www.ruthinking.co.uk

www.bpas.org

Telephone numbers

Family Planning Association 0845 122 8690

Brook Advisory Centre 0808 802 1234

Sexwise help line for under 18s 0800 282930 (This is a free phone number)

If you have a problem or query that has anything to do with contraception, sex, sexual health, pregnancy or a sexually transmitted infection, please speak to somebody about it. Speak to someone you trust or use one of the sources of support listed above.

Appendix 2: Data regrouping categories

Data were regrouped to generate enough numbers in cells for chi-square analysis

Note: Bracketed number represents numerical SPSS code

Original category	Grouped category
Continuous age variable	≤ 39 (1) ≥ 40 (2)
<i>Education</i>	
GCSE or O level (1)	Below degree level (1)
A level (2)	Below degree level (1)
Vocational training e.g. NVQ (3)	Below degree level (1)
Undergraduate (4)	Degree level or above (2)
Postgraduate (5)	Degree level or above (2)
University Diploma (6)	Degree level or above (2)
Ethnicity – chapters 2 & 3	
<i>Ethnicity – Chapters 2 & 3</i>	
White British (1)	White (1)
Asian/Asian British – Indian (2)	Non-White (2)
Mixed – White and Black Caribbean (3)	Non-White (2)
White Irish (4)	White (1)
White Other (5)	White (1)
Asian/Asian British – Pakistani (6)	Non-White (2)
Black – Other (7)	Non-White (2)
<i>Ethnicity – Chapter 4</i>	
White British (1)	White (1)
Mixed Other (2)	Non-White (2)
Asian/Asian British – Pakistani (3)	Non-White (2)
Asian/Asian British – Indian (4)	Non-White (2)
Mixed - White and Black Caribbean (5)	Non-White (2)
White Other (6)	White (1)
Black/Black British – African (7)	Non-White (2)
Black/Black British – Caribbean (8)	Non-White (2)
White Irish (9)	White (1)
Black – Other (10)	Non-White (2)
Asian – Other (11)	Non-White (2)
Mixed - White and Black African (12)	Non-White (2)
Other Ethnic – Chinese (13)	Non-White (2)
Other Ethnic (14)	Non-White (2)
Mixed - White and Asian (15)	Non-White (2)
Asian/Asian British – Bangladeshi (16)	Non-White (2)
<i>Ethnicity – Chapter 5</i>	
White (1)	White (1)
Black (2)	Non-White (2)
Asian (3)	Non-White (2)
Mixed (4)	Non-White (2)
Other (5)	Non-White (2)

Original category	Grouped category
<i>Sexuality – Chapter 2</i>	
Heterosexual (1)	Heterosexual (1)
Gay Male (2)	Gay (2)
Lesbian (3)	Gay (2)
<i>Sexuality – Chapters 3, 4 & 5</i>	
Heterosexual (1)	Heterosexual (1)
Gay Male (2)	Gay (2)
Lesbian (3)	Gay (2)
Bisexual (4)	Gay (2)
Relationship	
<i>Relationship status</i>	
In an open/casual relationship (1)	In a relationship (1)
Married/Civil Partner (2)	In a relationship (1)
Single (3)	Not in a relationship (2)
Long-term partner (4)	In a relationship (1)
Divorced/Dissolved civil partnership (5)	Not in a relationship (2)
Widowed/ Surviving civil partner (6)	Not in a relationship (2)
Separated (7)	Not in a relationship (2)
<i>Religiosity – Chapters 3,4 & 5</i>	
No I do not have any religious beliefs (1)	No religion (2)
Yes I have religious beliefs but I do not currently practice them (2)	Religion (1)
Yes I have religious beliefs and I currently practice them (3)	Religion (1)
<i>Gender/Age grouping</i>	
Younger Male	Male and ≤ 39 (1)
Older Male	Male and ≥ 40 (2)
Younger Female	Female and ≤ 39 (3)
Older Female	Female and ≥ 40 (4)

Appendix 3: Ethical approval for the elicitation study

REGISTRY RESEARCH UNIT ETHICS REVIEW FEEDBACK FORM

Name of applicant: Judith Hancock **Faculty/School/Department:** ARC HLI

Research project title: Buying, carrying, negotiating use, using and disposing: A qualitative exploration study of attitudes toward 5 condom behaviours

Comments by the reviewer

1. Evaluation of the ethics of the proposal:

Overall this is an ethically sound proposal for a worthy research project. There are, however, some issues that I feel should be considered before the project is undertaken.

i) Approaching people known to you to ask for permission for their children to participate in your study raises some ethical issues. In particular introducing the research in the presence of both the parents and children could be particularly uncomfortable for the children and is perhaps an unnecessary measure. While this method of recruitment may be used you must be careful to ensure that the younger participants are not made to feel uncomfortable and that they are able to feel that they can exercise their right not to participate. Another associated problem this raises is the public nature of the findings on the website. Even though individuals will not be identifiable the nature of the results could still potentially alert the parents to their children being sexually active (if, for example, every participant identifies as a non-virgin) which would be a major breach of participant confidentiality. I recommend that you ensure that this cannot be possible. Also, given the method of recruitment via parents the normally sensible method of generating a unique participant code by using the mother's maiden name may not make the participants feel that their data will be truly secure.

ii) Is using a population from SASH likely to be a useful population for research given their expertise in this area?

iii) Have you considered using the psychology department's student participation scheme as this group will be easily accessed and may be a useful demographic for the nature of your study?

2. Evaluation of the participant information sheet and consent form:

These materials are prepared to the necessary standard. One points to be considered, however, is:

Under 'possible benefits of taking part' you talk about promoting the consistent use of condoms. Could this lead to demand characteristics and lead participants who may not do this to feel negatively judged?

There are also a couple of typos that can be corrected:

i) A word is missing in the sentence 'There are details of website, help lines and instructions how to find your nearest drop-in centre' in the debrief sheet.

ii) In the questions a word is missing in the definition of a non-virgin.

3. Recommendation:

(Please indicate as appropriate and advise on any conditions. If there any conditions, the applicant will be required to resubmit his/her application and this will be sent to the same reviewer).

☐

Approved - no conditions attached

☒

Approved with minor conditions (no need to resubmit)

☐

Conditional upon the following – please use additional sheets if necessary (please re-submit application)

☐

Rejected for the following reason(s) – please use other side if necessary

☐

Further advice/notes - please use other side if necessary

Appendix 4: Example of attitudes textual analysis grid for negotiating behaviour

Note: This is a sample of the first 10 responses from the 26 complete responses

<i>Participant number</i>	<i>Advantages</i>	<i>Attitudes Disadvantages</i>	<i>Other</i>	<i>Affective Like</i>	<i>Attitudes Dislike</i>	<i>Done beh?</i>	<i>Comments</i>
1		None	No need		No feelings	N/A	No need to do beh due to relationship status
2	Avoid preg / caring of partner	Unromantic with new female partner		Necessity	Awkward – relationship dependent	Y	School education can't help / nerve wracking 1 st few times
3	Good practice / compassion	None		Common sense	Shouldn't be necessary	Y	New Vs committed relationship
4	Prevent preg / good			Good		Y	New Vs committed relationship
5	Control	Takes away passion		Discussion of safe sex	None	Y	
6	Consideration / regard	Partner suspicion		Nothing really	Embarrassment caused	N	
7	None	Not needed			Nothing	Y	Fine doing behaviour
8	Safety	Male dislike / social unease		None	Arguments over use / embarrassment	Y	
9	No preg scares			Trust building	Turn off in heat of moment	N	But no problem asking
10	Responsibility for own health	Cultural influences	Neg not to once > 60	Shared responsibility of F partner		Y	Career impact on attitudes / trusted relationship / FP

Appendix 5: Content Analysis theme coding for the elicitation study

Behaviours: Accessing (A), Carrying (C), Negotiating (N), Using (U) and Disposing (D)

Attitude (affective and cognitive themes and coding)

<i>Theme</i>	<i>Code</i>	<i>Sub-categories of beliefs</i>	<i>Behaviours</i>
Advantages & Likes coding	Self perceptions	(A)SP+	Less stigma, easy, control, independence, choice, good
	Impact on sexual act	(A)loSA+	Spontaneity, man's job, anticipation
	Practical issues	(A)Prl+	Convenience, machines, functional, discrete, prepared, necessary
	Prevent Pregnancy/STI	(A)PP/STI	Contraception
	Safe	(A)Safe+	Protected, piece of mind, happy
	Partner	(A)Part+	Compassion, trust, open, responsible, get to have sex, mature
	Physical impact	(A)Phl+	Hygienic, clean
Disadvantages & Dislike coding	Embarrassment	(A)E-	
	Impact on sexual act	(A)loSA-	Awkward, loss of spontaneity/sensation, forceful, unromantic, turned off, ruins mood, less intimate, nerve wracking, demonstration
	Practical issues	(A)Prl-	Taking up space, expiry
	Partner	(A)Part-	Argumentative, fearful, male dislike, confrontation
	Condom issues	(A)CI-	Smelly, reliability, cost
	Physical disposal	(A)PD-	Getting caught, timing, place
	Physical feel	(A)PF-	Unpleasant, dirty, strange
	Self perceptions	(A)SP-	Self-conscious, uneasy, others, presumptuous, cheating
	Culture	(A)C-	Religion

Subjective Norm coding

	<i>Theme</i>	<i>Code</i>	<i>Sub-categories of beliefs</i>	<i>Behaviours</i>
Approve coding	HCP	(SN)HCP+		A, C, N, U & D
	Partner	(SN)Part+		A, C, N, U & D
	Parents	(SN)Pare+		A, C, N, U & D
	Family	(SN)Fa+	Daughter	A, C, N, U & D
	Friends	(SN)Fr+		A, C, N, U & D
	Condom companies	(SN)CC+		A, U
	Safe sex charities	(SN)SSC+		A, C, N & U
	Culture	(SN)C+	Religion	A, C, U & D
Disapprove coding	Partner	(SN)Part-		A, C, N, U & D
	Culture	(SN)C-	Religion	A, C, N, U & D
	Parent	(SN)Pare-		N
	Family	(SN)Fa-		U & D
	Water companies	(SN)WC-	Property owners	D

Perceived Behavioural Control coding

	<i>Theme</i>	<i>Code</i>	<i>Sub-categories of beliefs</i>	<i>Behaviours</i>
Enabling	Situational	(PBC)Sit+	Proximity, vending machines, physical location e.g. festival, alcohol	A, C, N & U
	Physical	(PBC)Ph+	Infection, possession of	A, C, N & U
	Relationship status	(PBC)RS+		A, C & N
	Self	(PBC)Self+	Need/intention, experience	A, C, N & U
	Partner	(PBC)Part+	Trust, communications	C, N, U & D
	Environment	(PBC)Env+	Bin, home	D
Inhibiting	Situational	(PBC)Sit-	Time of day, visibility, cost, queues, physical location e.g. festival, opposite gendered staff, with family/friends, handbag/wallet, timing, mood, alcohol	A, C, N & U
	Culture	(PBC)C-	Religion	A, C, N & D
	Partner	(PBC)Part-		A, C, N & U
	Physical	(PBC)Ph-	Latex intolerant, packaging	C & N
	Self perceptions	(PBC)SP-	Self, Others	C
	Environment	(PBC)Env-	Bin, public place, home	D

Appendix 6: Copy of the online ACNUD questionnaire with the embedded participant information sheet and consent form

The same as Appendix 1, the researcher has indicated what information was on each page of the survey including the page headers the participants would have seen onscreen, the response options participants would have been given, and where a drop down box would have appeared. Example screen shots of the online survey have also been included to aid visualisation.

Page one – Information Sheet (version 1 12/08/10)

Title of Project: A cross-sectional investigation of condom beliefs using the ACNUD scale

Researcher: Jude Hancock

You are being invited to take part in a research study. Before you decide if you would like to take part, it is important that you understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Please email the researcher if there is anything that is not clear or if you would like more information (contact details below). Take time to decide whether or not you wish to take part. Thank you for reading this.

What is the purpose of this study?

This study is part of a doctoral programme exploring safer sex behaviours. This study will ask you to think about condoms (or femidoms or dental dams) and requires you to answer questions. The study aims to find out what people think about various condom behaviours such as accessing and using condoms. It does not matter if you have never used a condom as the study is asking about what you think about condoms and not your experience with them. Therefore it is important that you are honest in your answers and try to answer each question you are given.

Why have I been chosen?

The researcher hopes to gather opinions from a wide variety of people and appreciates you taking the time to click on the survey link. Because of your age you may well have a different perspective about condoms than someone younger or older than you. Furthermore, you may or may not have experience with using condoms (or femidoms or dental dams) and this is important as we need to know the opinions from people who have and have not used condoms.

Do I have to take part?

No. You are under no obligation to take part. If you decide to participate, then you may keep this information (remember to print it if you would like to keep a copy). You will be asked to complete a consent form when you move to the next page. You will however be free to withdraw at any time, without giving a reason, and without any consequences, should you change your mind.

What will happen to me if I take part?

You will be asked to complete an online survey that will take you about 20-30 minutes to complete. The survey will ask you to think about condoms (or femidoms or dental dams) and choose the response you most agree with in answer to each question you are given. At the end of the survey you will be asked if you would like to receive an invite to a future follow-up study where you will participate in an anonymous online safer sex intervention. You are not obliged to receive this invite or to take part if you do receive the invite.

Expenses and payments

There is no payment associated with your participation.

What do I have to do?

You will be required to answer a series of questions about condoms (or femidoms or dental dams). All questions will be a multiple choice answers and you will choose the answer you most agree with in answer to each question you are given. Before the questionnaire starts there will be a definition of what condoms, femidoms and dental dams are to help you. Your opinions are unique to you and the researcher would be grateful if you would share these. You will only have to answer each question once. You are also able to finish the survey before the end if you do not want to carry on.

What are the possible disadvantages and risks of taking part?

The greatest disadvantage of taking part is the impact on your time. It is possible that some of the questions asked might raise issues that you find difficult to deal with. If you have any concerns about the questions you have answered there will be a list of support available to you at the end of the survey. There will be no negative consequences for you as a result of your participation. The Coventry University Faculty of Health and Life Sciences Research Ethics Committee have reviewed this study.

What are the possible benefits of taking part?

You will be contributing to a programme of research that will culminate in the development of an intervention that is hoped will help people to have safer sex. Therefore it is likely that you will have some influence on this intervention with the answers you give to the questions, people who complete the intervention in the future may benefit from your feedback.

What happens when the research study stops?

The answers that you give to each question will be added to those given by other people who have taken part. The answers that all people give will be subjected to statistical analysis. This data will be used to create an online safer sex intervention. No-one will be able to identify you, as we will ask for you to create a unique identifier at the start of the survey, then once all the data is collected you will be assigned a participant number. It will be possible for you to obtain a written copy of the results by indicating that you would like to do this on the final pages of the survey (in order for you to do this it will be necessary for you to provide your name and email address). Alternatively you will be able to go to the following website where a copy of the report will be available www.healthinterventions.co.uk. The results are likely to be available in September 2011. If you decide to receive a copy of the report or to opt in to receive information about future research your personal details will be stored separately from the questionnaire responses you provide. It is also possible that the results from the study may be written up as academic papers, or presented at academic conferences. In all instances, it will be grouped data that are of interest, not individual opinions.

What will happen if I don't want to continue with the study?

You are free to withdraw from the study at any time by exiting the online survey. In addition, up to four weeks after you have completed the survey if you decide you do not want your data to be used you can contact the researcher (see details below) so that your data can be removed. The researcher will then destroy all information collected about you.

What if there is a problem?

It is unlikely that there will be a problem during the course of your participation in this research study. However, in the unlikely event of a problem with the research please inform the researcher who will try to resolve the matter and if necessary provide you

with details of relevant support services. Alternatively you can contact, Dr Katherine Brown, Department of Psychology, Coventry University, Priory Street, Coventry, CV1 5FB (k.brown@coventry.ac.uk, phone: 024 7688 8209). If you are still not happy, you may contact, the Coventry University Ethics Committee Chair, Professor Ian Marshall in writing at AB124, Coventry University, Priory Street, Coventry, CV1 5FB.

Complaints

If after participating in the study, you wish to make a complaint or comment regarding the professional conduct of the study, please, in the first instance contact the researcher.

Harm

There is no anticipated risk of harm involved with participation in this study. There are no compensation arrangements for participation in this research.

Will my taking part in the study be kept confidential?

All information that is collected about you during the course of the research will be kept strictly confidential. It will not be possible for anyone to identify your particular responses, as at the start of the study you will create your own unique identifier (the method for this will be explained when you log onto the survey) and from this point on the researcher will not know your identity, and no reference to your unique identifier will be made in the write up of research results. In any written reports the researcher will assign you a new unique identifier by which you will be identified. This will be a letter and a number such as P1, which will help the researcher know that you were for example, participant number one, hence P1. In this way anonymity will be maintained. Your completed survey and contact details (if given) will be held securely and all data will be processed in accordance with the 1998 Data Protection Act.

Contact details:

Researcher's name: Jude Hancock

Email: hancoc16@uni.coventry.ac.uk – preferred method of contact.

Research Student's Director of Studies:

Director of Studies name: Dr Katherine Brown

Email: K.Brown@coventry.ac.uk – preferred method of contact.

Postal Address: Department of Psychology, Coventry University, Priory Street, Coventry, CV1 5FB

Phone: 024 7688 8209

Page two – Consent Form (version 1 12/08/10)

1. I confirm that I have read and understood the participant information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these questions answered satisfactorily.
2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving a reason.
3. I understand that any information I provide will be kept confidential and that my identity will be kept anonymous.
4. I understand that the data will be treated according to the British Psychological Society Code of Ethics.
5. I understand that the information I provide may be used and analysed for research purposes and the findings may be published in an academic journal.
6. I understand that I may be asked to take part in an additional component of the research project and that I am under no obligation to take part.

7. I understand that I can request that any information I provide will be destroyed upon request.

8. I agree to take part in the above study.

(The options of Yes, I agree to the above consent form and No, I do not agree to the above consent form appeared)

Page three – Instructions

This questionnaire is split into three sections:

- 1 – Demographic information e.g. your age, whether you are male or female.
- 2 – Your preferred barrier method e.g. male condom, female condom or dental dam.
- 3 – Your thoughts about five condom behaviours (ACNUD)

Below are definitions of the five condom behaviours.

Accessing may mean purchasing, for example, from a shop or vending machine. It can also mean getting these for free, for example, in health centres or from your friends.

Carrying means the ability to physically access condoms (or femidoms or dental dams). This means you may carry these in your wallet/handbag or prefer not to physically carry them but keep some in a safe place at home.

Negotiating means communicating that you want to use a condom (or femidom or dental dam). You may do this verbally (e.g. do you have a condom) or non-verbally (e.g. getting a condom out).

Using means the physical act of using a condom (or femidom or dental dam).

Disposing means the physical act of disposing of a condom (or femidom or dental dam).

Please remember that all of your responses are strictly confidential. Each page will have instructions on how to answer each question. Please read each question carefully and answer it as truthfully as you can – sometimes people choose answers that they think others would want them to or would find most acceptable but we need to know how you really think and feel. There are no correct or incorrect responses; we are simply interested in your personal point of view.

Thank you for your participation in this study.

To help you complete the questionnaire an example is shown below. All questions will follow the same format.

1. An example

Please think about how accessing condoms makes you feel and respond to each question. The higher the score you give the more you agree to the feeling.

Accessing condoms makes me feel

Elated 1 -Not at all 2 3 4 -Neither 5 6 7 -Very much

In the example if you had chosen number 7 you would have responded that accessing condoms make you feel very elated. If you had chosen number 1 you would have responded that accessing condoms does not make you feel elated at all.

Page four – Demographics

1. Please create a unique identifier for yourself by putting in your day and month of birth and the first three letters of your mother's maiden name.
e.g. 28/02/FUR

2. Gender -are you:
(The options of male or female appeared)

3. Age -how old are you?
(A drop down menu with ages from 13 to 100+ appeared)

4. How would you describe your ethnic origin?
(A drop down menu with the following NHS categories appeared, White British, White Irish, White Other, Mixed - White and Black Caribbean, Mixed -White and Black African, Mixed - White and Asian, Other mixed, Asian/Asian British - Indian, Asian/Asian British - Pakistani, Asian/Asian British - Bangladeshi, Other Asian, Black/Black British – Caribbean, Black/Black British – African, Other Black, Other Ethnic – Chinese, Other Ethnic)

5. Please pick your highest level of education or the education level you are currently studying for.
(A drop down menu with the following categories appeared, GCSE or O level, Vocational training such a NVQ, A level, Undergraduate, Postgraduate, Other – please state)

6. Do you have religious beliefs?
(The options of Yes – I have religious beliefs and I currently practice them, Yes – I have religious beliefs but I do not currently practice them and No – I do not have any religious beliefs appeared)

7. Sexual Orientation.
To help you answer this question definitions of each category are provided.
Heterosexuals are individuals whose affectional/erotic attractions are to members of the other gender.
Gay (Gay male/Lesbian)are individuals whose affectional/erotic attractions are to members of the same gender.
Bisexuals are individuals whose affectional/erotic attractions are to both men and women.
Please answer the question in relation to how you feel about yourself.
(The options of Heterosexual, Gay male (I am a man and I am attracted to other men), Lesbian (I am a woman and I am attracted to other women), Bisexual appeared)

8. How would you describe your relationship status?
(The options of Single, Married/Civil Partner, Divorced/Person whose Civil Partnership has been dissolved, Widow/Surviving Civil Partner, Separated, In an open/casual relationship, I have a long-term partner appeared)

9. To help you answer the question on sexual experience definitions of each category are provided.
Virgin -we would normally consider somebody a virgin if they have not had sex

where a penis enters another person's anus or vagina, though we understand people may have different interpretations.

Non-Virgin -we would normally consider somebody no longer a virgin if they have had sex whereby a penis enters another person's anus or vagina, though we understand people may have different interpretations.

Please answer the question in relation to how you feel about yourself.

(The options of Virgin or Non-Virgin appeared)

Page five – Condoms, Femidoms and Dental Dams

A male condom is a flexible sheath, usually made of rubber or latex, designed to cover the penis during sexual intercourse for contraceptive purposes or as a means of preventing sexually transmitted disease during penetrative or oral intercourse.

(A picture of a condom was presented here)

A femidom is a similar device to a condom, consisting of loose-fitting polyurethane sheath closed at one end that is inserted intravaginally before sexual intercourse. It is also called a female condom.

(A picture of a femidom was presented here)

A dental dam is a flexible square, usually made of thin rubber or latex, designed to cover the vagina or anus as a means of preventing sexually transmitted diseases during oral intercourse.

(A picture of a dental dam was presented here)

1. For the purpose of this survey the terms 'condoms' will be used to cover the words condom, femidom and dental dam. Before you start to answer questions please pick the safer sex method from the three described that you would be most likely to use in the future. From then on please think about this method when you answer the questions.

(The options of Condom, Femidom, Dental Dam appeared)

On the following page there will be questions each with multiple-choice responses that we would like you to answer. Although all the questions have condom in the title we recognise that you may be thinking about a femidom or a dental dam instead and this is ok. We are interesting in what you think so please try and answer each question as honestly as you can. Please read each question carefully before you pick your response. There are no right or wrong answers; we are interested in your personal point of view. It may seem like we are asking you the same questions over and over again but we would appreciate you trying to answer each question as they are slightly different.

Page six – ACNUD

1. How much do you agree or disagree with the following statements about your intention to perform the five condom behaviours?

Scale anchors 1 (*strongly disagree*) and 7 (*strongly agree*)

I intend to carry condoms in the future in case I have sex

I intend to use a condom every time I have sex in the future

I intend to negotiate using condoms in the future every time I have sex

I intend to dispose of a used condom every time I have sex in the future

I intend to access condoms every time I have sex in the future

Example screen shot of the first set of intention questions

1. How much do you agree or disagree with the following statements about your intention to perform the five condom behaviours?

	1 - Strongly disagree	2	3	4 - Neither	5	6	7 - Strongly agree
I intend to carry condoms in the future in case I have sex	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I intend to use a condom every time I have sex in the future	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I intend to negotiate using condoms in the future every time I have sex	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I intend to dispose of a used condom every time I have sex in the future	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I intend to access condoms every time I have sex in the future	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2. How do performing these five condom behaviours make you feel?
Scale anchors 1 (*not at all*) and 7 (*very much*)

Carrying condoms makes me feel self-conscious
 Accessing condoms makes me feel self-conscious
 Negotiating condom use makes me feel awkward
 Using condoms makes me feel safe
 Accessing condoms makes me feel embarrassed
 Negotiating condom use makes me feel embarrassed
 Using condoms makes me feel embarrassed
 Using condoms makes me feel spontaneous
 Negotiating condom use makes me feel trustworthy
 Carrying condoms makes me feel responsible
 Disposing of a used condom makes me feel clean
 Accessing condoms makes me feel awkward
 Carrying condoms makes me feel embarrassed
 Disposing of a used condom makes me feel embarrassed
 Disposing of a used condom makes me feel pleasant

Example screen shot of the affective belief questions

2. How do performing these five condoms behaviours make you feel?

	1 - Not at all	2	3	4 - Neither	5	6	7 - Very much
Carrying condoms makes me feel self-conscious	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Accessing condoms makes me feel self-conscious	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Negotiating condom use makes me feel awkward	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Using condoms makes me feel safe	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Accessing condoms makes me feel embarrassed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Negotiating condom use makes me feel embarrassed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Using condoms makes me feel embarrassed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3. What do you think about performing the following condom behaviours?
Scale anchors 1 (*extremely bad*) and 7 (*extremely good*)

For me to use condoms during sexual intercourse is
 For me to dispose of condoms after sexual intercourse is

For me to negotiate using condoms before having sex is
 For me to carry condoms in case I have sex is
 For me to access condoms in advance of having sex is

Example screen shot of the direct attitude questions

3. What do you think about performing the following condom behaviours?

	1 - Extremely bad	2	3	4 - Neither	5	6	7 - Extremely good
For me to use condoms during sexual intercourse is	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
For me to dispose of condoms after sexual intercourse is	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
For me to negotiate using condoms before having sex is	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
For me to carry condoms in case I have sex is	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
For me to access condoms in advance of having sex is	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. How much do you agree or disagree with the following statements about the five condom behaviours? Scale anchors 1 (*strongly disagree*) and 7 (*strongly agree*)

Negotiating using condoms gives me control
 Carrying condoms makes you look like you're 'after it'
 It is harder for a female to negotiate using condoms
 It is harder for females to access condoms
 Using condoms is a safe thing to do
 There is no stigma associated with accessing condoms
 Carrying condoms will ultimately avoid getting a sexually transmitted disease
 You are more likely to be protected from sexually transmitted diseases if you negotiate using condoms
 Carrying condoms demonstrates that you are prepared if the opportunity for sex arises
 Using a condom means I get to have sex
 It is hygienic disposing of condoms
 Using condoms will avoid getting a sexually transmitted disease
 It is a man's job to dispose of a used condom
 I like the convenience of accessing condoms
 Disposing of condoms interrupts the sexual act

Example screen shot of the cognitive belief questions

4. How much do you agree or disagree with the following statements about the five condom behaviours?

	1 - Strongly disagree	2	3	4 - Neither	5	6	7 - Strongly agree
Negotiating using condoms gives me control	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Carrying condoms makes you look like you're 'after it'	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is harder for a female to negotiate using condoms	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is harder for females to access condoms	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Using condoms is a safe thing to do	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. Please estimate how often you have performed the five condom behaviours in the past month?

(The options of Every day, Almost every day, Most days, On about half the days, A number of times but less than half, A few, Never)

Accessed condoms?
 Carried condoms?
 Negotiated condom use?
 Used condoms?
 Disposed of a used condom?

Example screen shot of the number of times the behaviour has been performed in the past month question

5. Please estimate how often you have performed the five condom behaviours in the past month

Number of times in past month

Carried condoms

Used condoms

6. How much do you agree or disagree with the following statements about performing the five condom behaviours and what other people think?
 Scale anchors 1 (*strongly disagree*) and 7 (*strongly agree*)

My family thinks that I should use condoms
 My sexual partner thinks that I should use condoms
 My religion supports negotiation with a partner to use condoms
 I think I should use condoms
 My sexual partner thinks that I should dispose of a condom after use
 Health care professionals think that I should negotiate with a partner to use condoms
 Health care professionals think that I should carry condoms
 My family thinks that I should access condoms
 I think that I should dispose of a condom after use
 My religion supports me disposing of a condom after use
 I think that I should access condoms
 My religion supports me accessing condoms
 I think that I should carry condoms
 My sexual partner thinks that I should carry condoms
 I think that I should negotiate with a partner to use condoms

Example screen shot of the normative belief questions

6. How much do you agree or disagree with the following statements about performing the five condom behaviours and what other people think?

	1 - Strongly disagree	2	3	4 - Neither	5	6	7 - Strongly agree
My family thinks that I should use condoms	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My sexual partner thinks that I should use condoms	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My religion supports negotiation with a partner to use condoms	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think I should use condoms	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My sexual partner thinks that I should dispose of a condom after use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

7. How much do you agree or disagree with the following statements about the five condom behaviours? Scale anchors 1 (*strongly disagree*) and 7 (*strongly agree*)

I feel social pressure to access condoms
 I feel social pressure to carry condoms
 I feel social pressure to negotiate using a condom

I feel social pressure to use condoms
 I feel social pressure to dispose of condoms

Example screen shot of the direct subjective norm questions

7. How much do you agree or disagree with the following statements about the five condom behaviours?

	1 - Strongly disagree	2	3	4 - Neither	5	6	7 - Strongly agree
I feel social pressure to access condoms	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel social pressure to carry condoms	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

8. How much do you agree or disagree with the following statements about how much control you have over performing the five condom behaviours?
 Scale anchors 1 (*strongly disagree*) and 7 (*strongly agree*)

I am more likely to negotiate using condoms if my sexual partner wants me to
 I am more likely to carry condoms if I am in a new or casual relationship
 I am more likely to carry condoms if my sexual partner wants me to
 I am more likely to use a condom if my religion promotes this
 I am more likely to access condoms if I am in close proximity to a vending machine
 I am more likely to dispose of a condom if my culture promotes this
 I am less likely to access condoms if it is late at night
 I am more likely to negotiate using condoms if I am in a new or casual relationship
 I am more likely to negotiate using condoms if I have experience doing this
 I am more likely to carry condoms if I intend to use them
 I am more likely to dispose of a condom if there is a bin close
 I am more likely to dispose of a condom if I am at home
 I am more likely to use condoms if I am in a new or casual relationship
 I am more likely to access condoms if I have a need for them
 I am more likely to use a condom if my partner also wants to

Example screen shot of the control belief questions

8. How much do you agree or disagree with the following statements about how much control you think you have over performing the five condom behaviours?

	1 - Strongly disagree	2	3	4 - Neither	5	6	7 - Strongly agree
I am more likely to negotiate using condoms if my sexual partner wants me to	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am more likely to carry condoms if I am in a new or casual relationship	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am more likely to carry condoms if my sexual partner wants me to	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am more likely to use a condom if my religion promotes this	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

9. How much do you agree or disagree with the following statements about your plans to perform the five condom behaviours? Scale anchors 1 (*strongly disagree*) and 7 (*strongly agree*)

I plan to carry condoms in the future in case I have sex
 I plan to use a condom every time I have sex in the future
 I plan to negotiate using condoms in the future every time I have sex
 I plan to dispose of a used condom every time I have sex in the future
 I plan to access condoms every time I have sex in the future

Example screen shot of the second set of intention questions

9. How much do you agree or disagree with the following statements about your plans to perform the five condom behaviours?

	1 - Strongly disagree	2	3	4 - Neither	5	6	7 - Strongly agree
I plan to use a condom every time I have sex in the future	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I plan to access condoms every time I have sex in the future	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

10. Have you ever
(The options of Yes or No appeared)

Accessed condoms
Carried condoms
Negotiated condom use
Used condoms
Disposed of a used condom

Example screen shot of the ever performed behaviour questions

10. Have you ever

	Yes	No
Accessed condoms	<input type="radio"/>	<input type="radio"/>
Carried condoms	<input type="radio"/>	<input type="radio"/>
Disposed of a used condom	<input type="radio"/>	<input type="radio"/>
Negotiated condom use	<input type="radio"/>	<input type="radio"/>
Used condoms	<input type="radio"/>	<input type="radio"/>

10. How much do you agree or disagree with the following statements about performing the five condom behaviours? Scale anchors 1 (*strongly disagree*) and 7 (*strongly agree*)

It is up to me whether or not I access condoms in advance of having sex
It is up to me whether or not I carry condoms in case I have sex
It is up to me whether or not I negotiate to use a condom before having sex
It is up to me whether or not I use condoms during sexual intercourse
It is up to me whether or not I dispose of a condom after use

Example screen shot of the direct perceived behavioural control questions

11. How much do you agree or disagree with the following statements about performing the five condom behaviours?

	1 - Strongly disagree	2	3	4 - Neither	5	6	7 - Strongly agree
It is up to me whether or not I carry condoms in case I have sex	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is up to me whether or not I dispose of a condom after use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is up to me whether or not I use condoms during sexual intercourse	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Page seven – Thank You

Thank you very much for taking part in this piece of research. Your contribution has been very important to us.

We will download your data and be analysing your responses alongside all the other participants' data to decide what are the key topics that need to be addressed in the online intervention.

If you have any questions about this or anything else to do with this research then please feel free to ask. We will be more than happy to answer any questions we can. Alternatively, if you think of something later and wish to get in touch with us, you can do so using the contact details provided below (please remember to write this down before you go to the next page of the survey).

Jude Hancock
Applied Research Centre Health and Lifestyle Interventions
hancoc16@uni.coventry.ac.uk

1. If you would like to receive an invite to take part in the online intervention please provide your email address. Remember that you are not obliged to receive this invite or to take part if you do receive the invite.

(Space provided to write email address).

2. If you have provided your email address only to received a copy of the findings from this study please state this here.

(Space provided to write comments).

Example screen shot of the thank you section

1. If you would like to receive an invite to take part in the online intervention please provide your email address. Remember that you are not obliged to receive this invite or to take part if you do receive the invite.

2. If you have provided your email address only to received a copy of the findings from this study please state this here.

Page eight – Further Support

If you wish to seek further advice or support about sexual health issues below is a list of sources of help, advice and information. There are details of websites, help lines and instructions on how to find your nearest drop-in centre.

How to find your nearest drop-in centre

Go to the NHS website www.nhs.uk

Click on “find and choose services”

Click on “sexual health” (Please note you could use the walk in centre option as well)

In the search box type in your nearest town or city for a list of all drop-in centres available to you.

Remember you can always book an appointment with your own GP, its free and confidential.

Useful websites

www.nhs.uk/worhtakingabout
www.fpa.org.uk
www.brook.org.uk
www.ruthinking.co.uk
www.bpas.org

Telephone numbers

Family Planning Association 0845 122 8690
Brook Advisory Centre 0808 802 1234
Sexwise help line for under 18s 0800 282930 (This is a free phone number)

If you have a problem or query that has anything to do with contraception, sex, sexual health, pregnancy or a sexually transmitted infection, please speak to somebody about it. Speak to someone you trust or use one of the sources of support listed above.

Appendix 7: Ethical approval for the questionnaire studies

*REGISTRY RESEARCH UNIT
ETHICS REVIEW FEEDBACK FORM*

(Review feedback should be completed within 10 working days)

Name of applicant: Jude Hancock **Faculty/School/Department:** SASH/ARC HLI

Research project title: A longitudinal investigation of condom beliefs using the ACNUD scale

Comments by the reviewer

1. Evaluation of the ethics of the proposal:

This is a very well written and thought through proposal and it is clear that the candidate has a good understanding of the ethical issues relevant to the subject and proposed research.

2. Evaluation of the participant information sheet and consent form:

These are all appropriate and adhere to the BPS guidelines.

3. Recommendation:

(Please indicate as appropriate and advise on any conditions. If there any conditions, the applicant will be required to resubmit his/her application and this will be sent to the same reviewer).

☐

Approved - no conditions attached

☐

Approved with minor conditions (no need to resubmit)

☐

Conditional upon the following – please use additional sheets if necessary (please re-submit application)

☐

Rejected for the following reason(s) – please use other side if necessary

☐

Further advice/notes - please use other side if necessary

Name of reviewer: Dr Erica Bowen

Signature: 

Date: 13th September 2010

Appendix 8: Copy of the embedded participant information sheet, pre/post intervention and follow-up questionnaires and parts 1 and 2 debriefs

Participant information sheet & consent

Researcher: Jude Hancock
Director of Studies: Dr Katherine Brown

Researcher email: hancoc16@uni.coventry.ac.uk

We would be grateful if you would participate in a new online safer sex intervention. Before you decide to participate it is important for you to understand why the research is being carried out and what your participation will involve. Please read the following information carefully, and if you have any further queries about the study, please contact Jude Hancock (contact details provided above).

Over the past 18 months we have carried out research that has led to the development of this intervention. This intervention is aimed at anyone who is currently sexually active or might wish to be in the future. We wish to collect information from a wide variety of people. You may or may not have experience with using condoms (or femidoms or dental dams) and this is important as we need to know the opinions from people who have and have not used condoms. This study is in two parts. Today is part one where we require you to anonymously fill in an online questionnaire asking for some background information about you such as your age. You will then complete a questionnaire about condoms, and we would appreciate you being honest in your answers. You will then read some information about condoms and be required to complete a second questionnaire (very similar to the first). We will ask for your email address so that we can send you a third questionnaire to complete in 3 months time, this will be part two of the study. You are not obliged to take part in 3 months time when you receive the questionnaire if you do not wish. Part one should take you about 12 minutes, part two about 5 minutes.

Taking part in this intervention is entirely voluntary and you are free to withdraw at any stage. If at a later date (up to 4 weeks) you decide you do not wish your data to be used please email the researcher with the unique identifier you create on the next page and your data will be withdrawn. As this is an online study, you do not need to sign a consent form. Instead, completion of these questionnaires is taken as your consent.

This study is completely anonymous. Your data will remain confidential and securely stored for a minimum of seven years. All information collected for the project will be destroyed when no longer needed. Data will be linked to your unique identifier only to ensure anonymity. Please note that, to ensure the anonymity of your data, your email address will NOT be stored with your data.

This study has been reviewed, according to procedures specified by the Ethics Committee of the Faculty of Health and Life Sciences at Coventry University, and allowed to proceed.

We hope that findings from the study will be available around October 2012. Please keep an eye on www.healthinterventions.co.uk for updates on this study.

Thank you for taking the time to click on this link.

Jude

Pre intervention measures (for all groups)

Demographics – all response options the same as in Appendix 6 for the ACNUD scale
Unique identifier, email address, gender, age, ethnicity, education level, religious beliefs, sexual orientation, relationship status, sexual experience

TPB items (same items and scoring as ACNUD scale). The items are shown in the order they were presented to the participants.

Intention:

“How much do you agree or disagree with the following statements about your intentions to perform these condom behaviours?”, scale anchors 1 (*strongly disagree*) and 7 (*strongly agree*)

I intend to carry condoms in the future in case I have sex

I intend to negotiate using condoms in the future every time I have sex

I intend to use a condom every time I have sex in the future

Affective attitudes:

“How do performing these condom behaviours make you feel?”, scale anchors 1 (*not at all*) and 7 (*very much*)

Carrying condoms makes me feel responsible

Negotiating condom use makes me feel trustworthy

Using condoms makes me feel safe

Moral Norm:

“How much do you agree or disagree with the following statements about performing these condom behaviours and what you think?”, scale anchors 1 (*strongly disagree*) and 7 (*strongly agree*)

I think I should carry condoms

I think I should negotiate with a partner to use condoms

I think I should use condoms

Behaviour:

“How often in the past month have you?”, scale anchors 1 (*never*) and 7 (*everyday*)

Carried condoms

Negotiated condom use

Used condoms

Directly-measured attitude:

“What do you think about performing the following condom behaviours?”, scale anchors 1 (*extremely bad*) and 7 (*extremely good*)

For me to carry condoms in case I have sex is

For me to negotiate using condoms before having sex is

For me to use condoms during sexual intercourse is

Behaviour:

“How often in the past month have you been in the situation where”, scale anchors 1 (*never*) and 7 (*everyday*)

Carrying condoms was required?

Negotiating condom use was required?

Using a condom was required?

Directly-measured SN:

“How much do you agree or disagree with the following statements about performing these condom behaviours and what other people think?”, scale anchors 1 (*strongly disagree*) and 7 (*strongly agree*)

I feel social pressure to carry condoms

I feel social pressure to negotiate using a condom

I feel social pressure to use condoms

Directly-measured PBC:

“How much do you agree or disagree with the following statements about performing these condom behaviours?”, scale anchors 1 (*strongly disagree*) and 7 (*strongly agree*)

It is up to me whether or not I carry condoms in case I have sex

It is up to me whether or not I negotiate to use a condom before having sex

It is up to me whether or not I use condoms during sexual intercourse

Example screen shot of the pre-intervention measures and the ‘next’ button which took participants to one of three messages to read (control, positively-framed or negatively-framed)

Negotiating condom use was required?
Please pick

Using a condom was required?
Please pick

How much do you agree or disagree with the following statements about performing these condom behaviours and what other people think?

Please respond to these questions

I feel social pressure to carry condoms
1- Strongly Disagree 2 3 4 - Neither 5 6 7 - Strongly Agree

I feel social pressure to negotiate using a condom
1- Strongly Disagree 2 3 4 - Neither 5 6 7 - Strongly Agree

I feel social pressure to use condoms
1- Strongly Disagree 2 3 4 - Neither 5 6 7 - Strongly Agree

How much do you agree or disagree with the following statements about performing these condom behaviours?

Please respond to these questions

It is up to me whether or not I carry condoms in case I have sex
1- Strongly Disagree 2 3 4 - Neither 5 6 7 - Strongly Agree

It is up to me whether or not I negotiate to use a condom before having sex
1- Strongly Disagree 2 3 4 - Neither 5 6 7 - Strongly Agree

It is up to me whether or not I use condoms during sexual intercourse
1- Strongly Disagree 2 3 4 - Neither 5 6 7 - Strongly Agree

Next

Note: The text “please respond to these questions” only appeared if participants clicked the ‘next’ button and had not responded to the question.

Immediate post intervention measures (for all groups)

TPB items (same items and scoring as ACNUD scale). The items are shown in the order they were presented to the participants.

Message acceptability:

“What did you think about the information you just read?”, scale anchors,

1 (*not at all interesting*) and 7 (*very interesting*)

1 (*not at all memorable*) and 7 (*very memorable*)

1 (*not at all persuasive*) and 7 (*very persuasive*)

1 (*not at all helpful*) and 7 (*very helpful*)

1 (*not at all accurate*) and 7 (*very accurate*)

Intention, same measure and anchors as pre-intervention.

Affective attitudes, same measure and anchors as pre-intervention.

Directly-measured attitudes, same measure and anchors as pre-intervention.

Moral Norm, same measure and anchors as pre-intervention.

Directly-measured SN, same measure and anchors as pre-intervention.

Message acceptability:

“Did you think the information you just read was?”, scale anchors,

1 (*not at all interesting*) and 7 (*very interesting*)

1 (*not at all memorable*) and 7 (*very memorable*)

1 (*not at all persuasive*) and 7 (*very persuasive*)

1 (*not at all helpful*) and 7 (*very helpful*)

1 (*not at all accurate*) and 7 (*very accurate*)

Directly-measured PBC, same measure and anchors as pre-intervention.

3-month post intervention measures (for all groups)

Demographics

Relationship status, sexual experience

TPB items (same items and scoring as ACNUD scale). The items are shown in the order they were presented to the participants.

Intention, same measure and anchors as pre-intervention.

Affective attitudes, same measure and anchors as pre-intervention.

Moral Norm, same measure and anchors as pre-intervention.

Behaviour, same measure and anchors as pre-intervention.

Directly-measured attitude, same measure and anchors as pre-intervention.

Behaviour, same measure and anchors as pre-intervention.

Directly-measured SN, same measure and anchors as pre-intervention.

Directly-measured PBC, same measure and anchors as pre-intervention.

Part one participant de-brief sheet (after post intervention questionnaire)

Thank you very much for taking part in this piece of research. Your contribution has been very important to us.

We will download your data and be analysing your responses alongside all the other participants' data to establish whether this online safer sex intervention works. Remember that we will be contacting you again in 3 months time to complete a second questionnaire but you are not obliged to fill this in if you do not wish.

If you have any questions about this or anything else to do with this research then please feel free to ask. We will be more than happy to answer any questions we can. Alternatively, if you think of something later and wish to get in touch with us, you can do

so using the contact details provided below (please remember to write this down before you close the website).

Jude Hancock
Applied Research Centre Health and Life Sciences
hancoc16@uni.coventry.ac.uk

If you wish to seek further advice or support about sexual health issues below is a list of sources of help, advice and information. There are details of website, help lines and instructions how to find your nearest drop-in centre.

How to find your nearest drop-in centre

Go to the NHS website www.nhs.uk
Click on “health services near you” then “more services”
Click on “sexual health” (Please note you could use the walk in centre option as well)
In the search box type in your nearest town or city for a list of all drop-in centres available to you.

Remember you can always book an appointment with your own GP, it’s free and confidential.

Useful websites
www.nhs.uk/worhtalkingabout
www.fpa.org.uk
www.brook.org.uk
www.ruthinking.co.uk
www.bpas.org

Telephone numbers

Family Planning Association	0845 122 8690	
Brook Advisory Centre	0808 802 1234	
Sexwise help line for under 18s	0800 282930	(This is a free phone number)

If you have a problem or query that has anything to do with contraception, sex, sexual health, pregnancy or a sexually transmitted infection, please speak to somebody about it. Speak to someone you trust or use one of the sources of support listed above.

Part two participant de-brief sheet (after follow-up questionnaire)

Thank you, for completing this second questionnaire. This is now the end of your participation in the study. Please remember that if you decide you do not want your data to be used for research purposes you may request for your data to be withdrawn (up to 4 weeks). To withdraw your data please email the researcher (Jude Hancock) and quote the unique identifier you created for yourself in part one of the study.

For this study you were randomly assigned to one of three groups, you either read some information about the history of the condom, or read a message about performing three condom behaviours (carrying, negotiating and using) that was either positively or negatively worded. This study has been conducted to establish whether reading positively or negatively worded messages about condom behaviours are more successful at changing intentions to perform, and possibly actually performing these condoms behaviours, compared to reading a neutral message about condoms.

The reason for studying condom behaviours is that in both younger and older people the rates of sexually acquire infections are rising (Health Protection Agency 2010). Safer sex is important for anyone who is currently sexually active or intends to be in the future. Potentially changing beliefs toward performing condom behaviours may change people's attitudes and intentions to practice safer sex and motivate people to have safer sex when the situation arises. We are very grateful for you taking the time to complete this study.

The research findings may be used in the future to fine-tune the intervention so that it can be made available for other people to use.

Remember if you wish to seek further advice or support about sexual health issues below is a list of sources of help, advice and information. There are details of website, help lines and instructions how to find your nearest drop-in centre.

How to find your nearest drop-in centre

Go to the NHS website www.nhs.uk

Click on "health services near you" then "more services"

Click on "sexual health" (Please note you could use the walk in centre option as well)

In the search box type in your nearest town or city for a list of all drop-in centres available to you.

Remember you can always book an appointment with your own GP, it's free and confidential.

Useful websites

www.nhs.uk/worhtalkingabout

www.fpa.org.uk

www.brook.org.uk

www.ruthinking.co.uk

www.bpas.org

Telephone numbers

Family Planning Association 0845 122 8690

Brook Advisory Centre 0808 802 1234

Sexwise helpline for under 18s 0800 282 930 (this is a freephone number)

If you have a problem or query that has anything to do with contraception, sex, sexual health, pregnancy or a sexually transmitted infection, please speak to somebody about it. Speak to someone you trust or use one of the sources of support listed above.

Appendix 9: Copy of the intervention materials

Control group

A brief history of the condom

1220 BC: Condom use can be traced back to Ancient Egypt and from that time the condom has protected man from disease and infection.

100–200 AD: The earliest evidence of condom use in Europe are scenes from cave paintings at Combarelles in France.

1500s: Gabrielle Fallopius advocated the use of linen sheaths to protect against syphilis. Other materials used over the years include tortoiseshell, leather, oiled paper, fish bladders and animal gut.

1843: The revolutionary rubber vulcanisation process invented by Goodyear and Hancock made it possible to mass-produce more reliable and less expensive products including condoms.

1930s: Liquid latex manufacturing supersedes crude rubber. It is still the basis for manufacture today.

1990s: New technology has improved the condom and enabled production of more sophisticated versions than our ancestors were used to. The latest development is DUREX[®] AVANTI made from a unique polyurethane material, DURON, which is twice as strong as latex enabling a thinner, more sensitive film.

Word 170

Screen shot of control group page

Please read the following brief history about condoms before moving to the next page.

1220 BC: Condom use can be traced back to Ancient Egypt and from that time the condom has protected man from disease and infection.



100-200 AD: The earliest evidence of condom use in Europe are scenes from cave paintings at Combarelles in France.

1500s: Gabrielle Fallopius advocated the use of linen sheaths to protect against syphilis. Other materials used over the years include tortoiseshell, leather, oiled paper, fish bladders and animal guts.


1843: The revolutionary rubber vulcanisation process invented by Goodyear and Hancock made it possible to mass-produce more reliable and less expensive products including condoms.

1930s: Liquid latex manufacturing supersedes crude rubber. It is still the basis for manufacture today.

1990s: New technology has improved the condom and enabled production of more sophisticated versions than our ancestors were used to. The latest development is DUREX[®] AVANTI made from a unique polyurethane material, DURON, which is twice as strong as latex enabling a thinner, more sensitive film.

Next



Male Condoms

Female Condom

Dental Dams

Intervention group 1 – negatively-framed

Condoms come in three 'types', the male and female condoms which are used for penetrative sex and the dental dam used for oral sex.

Carrying a condom increases your chances that you will use a condom when needed, thus reducing your chances of contracting a sexually transmitted disease. You may wish to carry a condom in a wallet/purse, handbag, or pocket or you may prefer to store a packet at home. The key is to have a condom accessible when it's needed. People who do not carry condoms are less responsible. You may want to carry condoms.

Negotiating with a partner to use a condom may be done verbally (e.g. do you have a condom) or non-verbally (e.g. getting a condom out). It is important to show you want to have safer sex. People who do not negotiate safer sex are less trustworthy. You may want to negotiate to use a condom.

Using a condom reduces your chances of contracting a sexually transmitted disease and unwanted pregnancy. People who do not use condoms are less safe, exposing themselves to sexually transmitted disease and unwanted pregnancy. You may want to use a condom.

Words 192

Screen shot of the negatively-framed intervention page


Please read the following information about condoms before moving to the next page.

Condoms come in three 'types', the male and female condom which are used for penetrative sex and the dental dam used for oral sex.


Carrying a condom increases your chances that you will use a condom when needed, thus reducing your chances of contracting a sexually transmitted disease. You may wish to carry a condom in a wallet/purse, handbag, or pocket or you may prefer to store a packet at home. The key is to have a condom accessible when it's needed. People who do not carry condoms are less responsible. You may want to carry condoms.

Negotiating with a partner to use a condom may be done verbally (e.g. do you have a condom) or non-verbally (e.g. getting a condom out). It is important to show you want to have safer sex. People who do not negotiate safer sex are less trustworthy. You may want to negotiate to use a condom.

Using a condom reduces your chances of contracting a sexually transmitted disease and unwanted pregnancy. People who do not use condoms are less safe, exposing themselves to sexually transmitted disease and unwanted pregnancy. You may want to use a condom.




Male Condoms



Female Condom

Next



Dental Dams

Intervention group 2 – positively-framed

Condoms come in three 'types', the male and female condoms which are used for penetrative sex and the dental dam used for oral sex.

Carrying a condom increases your chances that you will use a condom when needed, thus reducing your chances of contracting a sexually transmitted disease. You may wish to carry a condom in a wallet/purse, handbag, or pocket or you may prefer to store a packet at home. The key is to have a condom accessible when it's needed. People who carry condoms are more responsible. You may want to carry condoms.

Negotiating with a partner to use a condom may be done verbally (e.g. do you have a condom) or non-verbally (e.g. getting a condom out). It is important to show you want to have safer sex. People who negotiate safer sex are more trustworthy. You may want to negotiate to use a condom.

Using a condom reduces your chances of contracting a sexually transmitted disease and unwanted pregnancy. People who use condoms are safer (from contracting a sexually transmitted disease and unwanted pregnancy). You may want to use a condom.

Words 185

Screen shot of the positively-framed intervention page


Please read the following information about condoms before moving to the next page.

Condoms come in three 'types', the male and female condoms which are used for penetrative sex and the dental dam used for oral sex.


Carrying a condom increases your chances that you will use a condom when needed, thus reducing your chances of contracting a sexually transmitted disease. You may wish to carry a condom in a wallet/purse, handbag, or pocket or you may prefer to store a packet at home. The key is to have a condom accessible when it's needed. People who carry condoms are more responsible. You may want to carry condoms.

Negotiating with a partner to use a condom may be done verbally (e.g. do you have a condom) or non-verbally (e.g. getting a condom out). It is important to show you want to have safer sex. People who negotiate safer sex are more trustworthy. You may want to negotiate to use a condom.

Using a condom reduces your chances of contracting a sexually transmitted disease and unwanted pregnancy. People who use condoms are safer (from contracting a sexually transmitted disease and unwanted pregnancy). You may want to use a condom.




Male Condoms



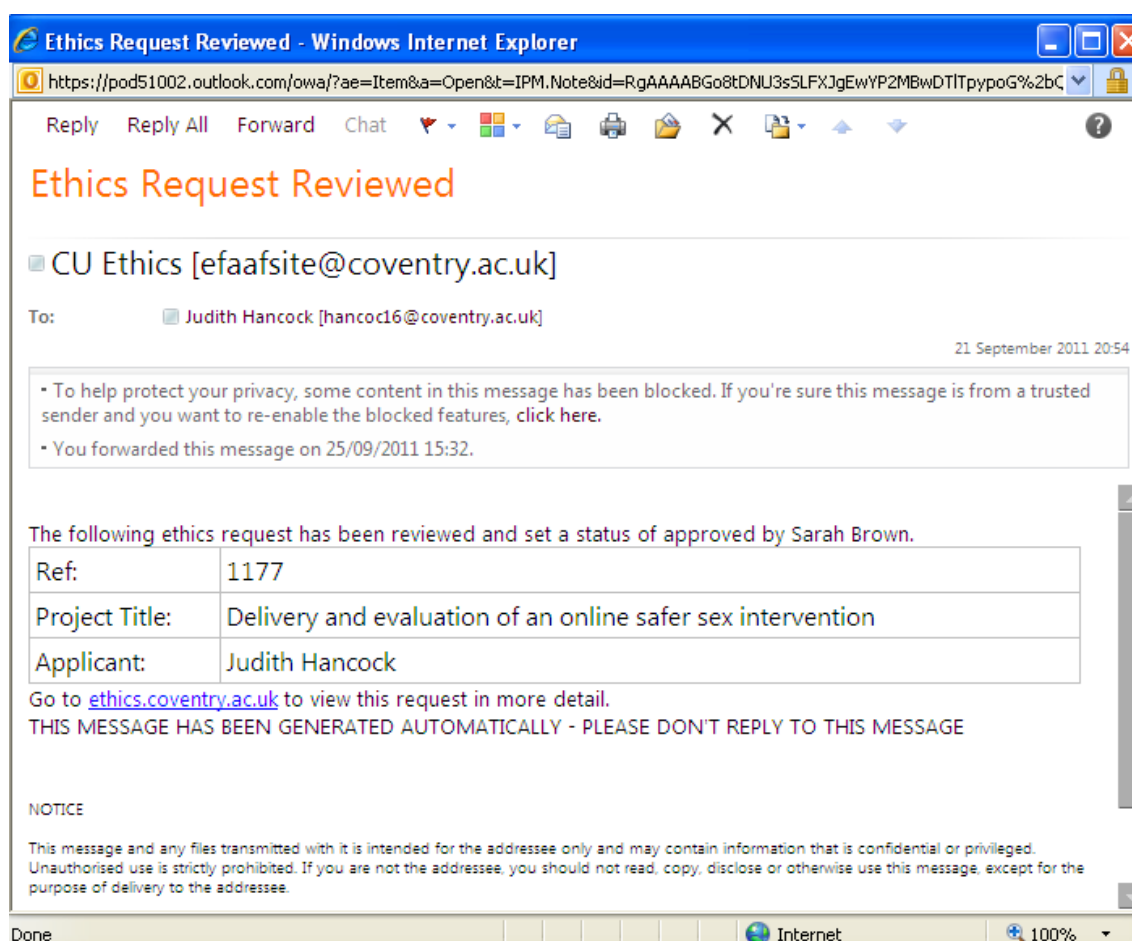
Female Condom

Next



Dental Dams

Appendix 10: Ethical approval for the intervention study



Appendix 11: LifeGuide methodological review

Building the individual intervention pages using the LifeGuide authoring tool was a straightforward process, as envisaged by the LifeGuide developers (Hare et al. 2009). The online LifeGuide community provided valuable support for fixing minor problems that occurred during page development, such as images not loading in the preview intervention mode (Hare et al. 2009). However, although the LifeGuide community has detailed web pages to assist in writing the intervention logic (Williams et al. 2010), which is required to link pages of the intervention, send automated emails, and randomise participants, these web pages detailing the logic commands are not entirely up-to-date. LifeGuide developers are regularly discovering new issues with the logic and consequentially cannot keep the logic help pages current. As a result of this, the LifeGuide programmer was paid for 10 hours work to make important changes to the logic that could not be carried out by the researcher. For example, logic needed to be written so that if a participant completed the T1 measures and pressed 'next', but subsequently decided to change one or more of their answers and clicked on the back button of their web browser, changed these answers and then pressed 'next', LifeGuide would not then re-randomise the participant into another condition. If this were to have been allowed to happen, the same participant would have been recorded as two separate participants, but only one would have had a complete pre-post intervention data set.

A further problem with the intervention emerged when LifeGuide started to send out the automated follow-up links. During piloting it was found that the link to complete part two of the intervention was not working. The LifeGuide programmer was asked to correct the link before the main study was launched. Unfortunately, a second broken link was being sent out in the main study three month follow-up, which was only brought to the researcher's attention when a participant emailed the researcher to bring this issue to their attention. The researcher then had to manually calculate each participant's three month follow-up date (from the initial log-in date stored with the LifeGuide account details), and email each participant at their three month point apologising that there had been problems with the link, and providing the working link to the intervention. This issue may have partially contributed to the high attrition rate from T2 to T3. Although, the attrition rate in online safer sex interventions tends to be higher than in face-to-face studies (Bailey et al. 2010), the difficulties with the link in the automated email may have led to a higher retention rate, as the personalised email from the researcher may have prompted some participant's to complete the T3 measures (Bosnjak, Tuten and Wittman 2009; Hallet et al. 2009). The problems experienced with delivery of the online intervention should be considered in future studies using online delivery, which may impact on the efficacy of online interventions.

Appendix 12: Publications

Hancock, J. (2012) How to do simple within-person analysis across multiple measures. *PsyPAG Quarterly*, 84, 10-14.

Hancock, J., Lees, S. and Brown, K. (2011) Health Psychology's role in sexual health care. *Europe's Journal of Psychology*, 7 (3), 550-564. Published online www.ejop.org

The full text of both these papers has been removed due to third party copyright. The unabridged version of the thesis can be viewed at the Lanchester Library, Coventry University.

Appendix 13: Conference presentations – oral and posters

Orals

Hancock, J., Brown, K.E and Hagger, M. (2012) 'Changing intentions to perform three condom behaviours in the general population: An online intervention study'. ENRGHI conference, 10-11th September 2012, in London, UK

Hancock, J., Brown, K.E and Hagger, M. (2012) 'Design and development of an online safer sex intervention using an extended Theory of Planned Behaviour'. PsyPAG conference, 18-20th July 2012, in Newcastle, UK.

Hancock, J. (2012) 'Online Interventions'. Invited speaker at the Division of Health Psychology Postgraduate workshop, 28-29th June 2012, in University of Bedford, UK.

Hancock, J., Brown, K.E and Hagger, M. (2012) 'Comparing affective versus cognitive beliefs, and attitudes versus subjective norms in the prediction of intention to perform five condom behaviours'. British Psychological Society Annual Conference, 18-20th April 2012, in London, UK.

Hancock, J. and Brown, K.E. (2011) 'Understanding your population: The need for exploratory work'. Symposium presentation to the British Psychological Society Annual Conference, 4-6th May 2011, in Glasgow, UK.

Posters

Hancock, J., Brown, K.E. and Hagger, M. (2012) 'Condom embarrassment: Gender and age differences in a UK sample'. Faculty of Health and Life Sciences Research Symposium, 17th April 2012, in Coventry University, UK.

Hancock, J., Brown, K.E. and Hagger, M. (2012) 'Positive and negative affective, cognitive, normative and control beliefs towards five condom behaviours: Are positive more common than negative beliefs? '. MURG Conference, 27-28th March 2012, in Coventry, UK.

Hancock, J., Brown, K.E. and Hagger, M. (2012) 'An exploration of age and gender differences in performance of condom behaviours in the early 21st Century'. Midlands Health Psychology Network Conference, 16th February 2012, in Coventry, UK.

Hancock, J., Brown, K.E. and Hagger, M. (2011) 'Identifying safer sex behaviours and variables to target in an intervention: An online cross-sectional study'. Division of Health Psychology Annual Conference, 14th-16th September 2011, in Southampton, UK.

Joshi, P., Brown, K., Newby, K., Bayley, J., Hancock, J., Choudhry, K. and Baxter, A. (2011) 'Conception, development, implementation and revision: Sexual health interventions in action'. Division of Health Psychology Annual Conference, 14th-16th September 2011, in Southampton, UK.

Hancock, J., Brown, K.E. and Hagger, M. (2011) 'Exploration of beliefs about condom behaviours in a convenience sample of over 55 year olds: An online elicitation study'. World Congress for Sexual Health, 12-16th June 2011, in Glasgow, UK.

Hancock, J., Brown, K.E. and Hagger, M. (2011) 'Developing the ACNUD scale tapping multiple condom behaviours: Belief-based versus multiplicative measures'. Faculty of Health and Life Sciences Research Symposium, 14th April 2011, in Coventry University, UK.

Hancock, J., Brown, K.E. and Hagger, M. (2010) 'A qualitative exploration study of condom behaviours'. UKSBM, 14-15th December 2010, in Leeds University Institute of Health Sciences, UK.

Hancock, J. & Brown, K. E. (2010) 'Buying, carrying, negotiating use, using and disposing: A qualitative exploratory study of attitudes toward five condom behaviours'. Faculty of Health and Life Sciences Research Symposium, 20th May 2010, in Coventry University, UK.

Appendix 14: Miscellaneous outputs

Other non-peer reviewed written outputs

Hancock, J. (2012) 'Delivery and evaluation of an online safer sex intervention'. *Participate newsletter of Warwick and Coventry Primary Care Research Network*, Summer edition.

Hancock, J. (2012) 'The importance of safer sex'. *British Psychological Society South West Review*, Spring edition.

Hancock, J. (2011) 'Delivery and evaluation of an online safer sex intervention'. *Participate newsletter of Warwick and Coventry Primary Care Research Network*, Winter edition.

Hancock, J. (2011) 'Identifying variables and condom behaviours to target in an online safer sex intervention applicable to the general population'. *Participate newsletter of Warwick and Coventry Primary Care Research Network*, Summer edition.

Hancock, J. (2011) 'ACNUD study'. *Participate newsletter of Warwick and Coventry Primary Care Research Network*, Spring edition.

Hancock, J. (2011) 'Condom research'. *Coventry Alumni E-News*, March.

Hancock, J. and Brown, K. (2010) 'Exploration of condom behaviours'. *Participate newsletter of Warwick and Coventry Primary Care Research Network*, Summer edition.

Written material mentioned in

The Psychologist (2011) 'Sexual health interventions in action', write up of the annual BPS conference in Glasgow in the July edition of the magazine, 24 (7), 491.

Presentations in Coventry University

Hancock, J. (2010) 'Religion as a factor shaping condom beliefs'. Oral presentation given as part of the Foundations in Contraceptive and Reproductive Health Care Course, 8th December 2010, in Coventry University, UK.

Hancock, J. (2010) 'A qualitative exploration study of condom behaviours'. Oral presentation given to the Psychology department research seminar series and journal club, 27th October 2010 in Coventry University, UK.

Invited speaker

Hancock, J. (2012) 'Career journey in health psychology to date'. Oral presentation given at the Midlands Health Psychology Network 'what is health psychology' study day, 29th November 2012 in Coventry University, UK.

Abstracts accepted but unable to present

Hancock, J., Brown, K.E. and Hagger, M. (2011) 'Developing the ACNUD scale tapping multiple condom behaviours'. Was accepted as an oral presentation at the 12th European Congress of Psychology, 4-8th July 2011, in Istanbul, Turkey.

Hancock, J., Brown, K.E. and Hagger, M. (2011) 'Exploring affective and cognitive attitudes of condom behaviours: An online elicitation study'. Was accepted as an oral presentation at the 12th European Congress of Psychology, 4-8th July 2011, in Istanbul, Turkey.